Skull's Guide To Home-Built AR15s

[Skullcap]

6/24/2022

Due to both a desire to publish something and update some people on current laws revolving around the easiest method of entry into the home gunsmithing hobby, I had decided to write this guide on the subject of producing your own AR15 rifle at home without the feds poking their noses into things.
There are plenty of guides on this subject, but I'm making sure to keep the current legal situation mentioned before all else to inform that hobby gunsmithing is still legal, you just need to know what to avoid.

As of the time of this writing, all of these new law proposals by the ATF towards 80% lowers will go into effect on August 24th of 2022, so although they are not present just yet, everything is written in the case that they are to avoid having to look through all the legal guides for further confirmation.

"Definitely a time saver. Most people don't go through the effort of finding a variety of things on important subjects, so I find this rather helpful for people getting into the subject. Also good that it's easy to understand."
- First reviewer

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Dedicated to
Free men.

The author assumes no liability for injury that may result from the misuse of information provided within this book.

(I am not sponsored by any brand in particular that I may cite, nor am I associated with any brand or party that may be mentioned.)

CONTENTS

- The Futility Of Gun Control.....................................6-9
- What Are The Laws?...11-22
- What is an 80% Lower?..23-27
- Introduction to Terminology....................................28-29
- Lower Receiver Parts...30-33
- Buffer Tubes & Weights...34-39
- Carbine/Fixed Stocks...40-42
- Buffer Springs...43-44
- Castle Nuts & End Plates.......................................45-47
- Pistol Grips...48-49
- Triggers...50-58
- The Rest of Your LPK...59-64
- Upper Receiver Parts...65-67
- (Externals)..67-69
- Forward Assist Assembly..70-71
- Dust Cover...72-73
- Barrels..74-82
- Gas Tubes & Blocks...83-85
- Muzzle Devices...86-90
- Handguards...91-95
- (Internals)..96
- Bolt Carrier Group...96-99
- Charging Handle..100-101
- Building...102-103
- (Tooling)..104-106
- Milling..107-110
- Lower Receiver Assembly..111

- Fire Control Group……………………………………………111-115
- Magazine Catch…………………………………………………116-117
- Bolt Catch………………………………………………………….118-119
- Selector & Stock Assembly……………………………………120-136
- Upper Assembly……………………………………………………137-138
- Forward Assist & Dust Cover…………………………………139-143
- Bolt Carrier Group………………………………………………144-148
- Charging Handle…………………………………………………149
- Barrels & Handguards……………………………………………150-154
- Muzzle Device…………………………………………………….155
- Final Assembly……………………………………………………156
- Maintenance Suggestions………………………………157
- Trouble-Shooting…………………………………………158

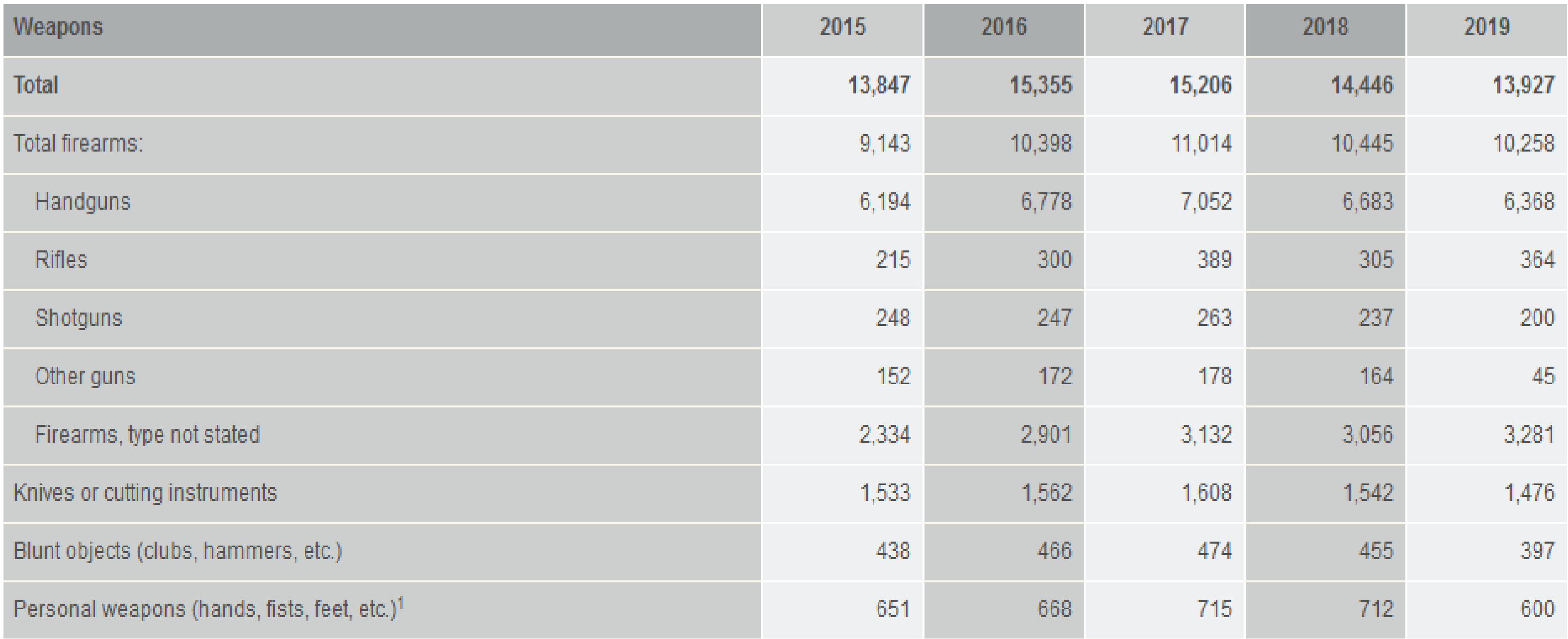
THE FUTILITY OF GUN CONTROL

My general philosophy lies in a disinterest in debate, as my actions *are* my argument for things and this book is itself an example of how gun control is futile so long as people have the knowledge to make their own firearms for their own use, whether it be for sport, defense, or fun.

For anyone who may be new to the subject of guns and still running about arguing about things like gun crime, I will humor you by citing all things I consider relevant on the subject of the gun debate prior to getting into the details of making your own firearm at home just to prove my point and end it here.

- America is not a country where gun laws are nonexistent.
  The legal codes defining firearms vary by state, but there have been federal gun laws ranging back for decades, particularly starting with the National Firearms Act of 1934, and on going to the Gun Control Act of 1968, and then the modification of the NFA in 1986.
  That is just a brief overview of federal examples, and state-wise, gun laws change relatively often.
  Some are more friendly towards it and others not so much.

- More people die from handguns than rifles every year.



Weapons	2015	2016	2017	2018	2019
Total	**13,847**	**15,355**	**15,206**	**14,446**	**13,927**
Total firearms:	9,143	10,398	11,014	10,445	10,258
Handguns	6,194	6,778	7,052	6,683	6,368
Rifles	215	300	389	305	364
Shotguns	248	247	263	237	200
Other guns	152	172	178	164	45
Firearms, type not stated	2,334	2,901	3,132	3,056	3,281
Knives or cutting instruments	1,533	1,562	1,608	1,542	1,476
Blunt objects (clubs, hammers, etc.)	438	466	474	455	397
Personal weapons (hands, fists, feet, etc.)[1]	651	668	715	712	600

These numbers are from the FBI homicide data, which anyone can access, but nobody scared of guns ever reads.

https://ucr.fbi.gov/crime-in-the-u.s/2019/crime-in-the-u.s.-2019/tables/expanded-homicide-data-table-8.xls

- The NRA has been more detrimental to gun rights than in support of them.
  There are a few parts to this claim.
  Robert Farago from The Truth About Guns wrote an article in 2010 about a possible theory that the NRA may be secretly funding anti-gun politicians, and the reason why is the same any party in particular may actively work against their alleged goals. If all gun laws were to cease, the claimed goal of the NRA would cease to be necessary, and with that their members would no longer need to support them and that means no more money coming in for them. Basically hyping up things to get some fear going to increase their donations, but doing little enough to make it seem like they're

working on what their members want, but in slow steps so they can say they just need more support to get more done.

https://www.thetruthaboutguns.com/is-the-nra-secretly-supporting-gun-control/#comments

- The NRA supported disarming the black panthers back in the 60s.

https://www.history.com/news/black-panthers-gun-control-nra-support-mulford-act

- A poll by Time in 2018 showed 69% of NRA members were in favor of expanding background checks on gun purchases.

https://time.com/5197807/stricter-gun-laws-nra/

- The NRA also supported Trump's bumpstock ban.

https://www.npr.org/2017/10/05/555894008/nra-backs-regulation-of-bump-stocks-as-some-republicans-support-a-ban

- Anti-gun laws only effect those who follow them
  It goes without saying, but sadly some people aren't capable of rational thought.
  The idea behind a law is that it is only to keep those who are law abiding from breaking it, as the definition of 'criminal' always remains someone who does not abide to the law.

- Knowledge is power and that applies to guns.
  Gun laws do not stop people from producing their own firearms, even in places with a nearly non-existent gun culture.
  In a 2014 article by The Firearms Blog, 10% of firearms seized by police in Australia are homemade.
  In addition to this, homemade firearms from literal junk have been a thing since the earliest days of firearm building, especially among kids in the 50s.
  If you have the knowledge to make a firearm, you can make them, even out of scrap materials.

  https://www.thefirearmblog.com/blog/2014/06/16/australian-police-10-firearms-seized-homemade/

  https://www.thefirearmblog.com/blog/2019/05/30/improvised-firearms-zip-guns-like-grandpa-used-to-make/

I can go on and on about things like most guns being used in crime either being stolen or from out of state, but like I said at the beginning, my philosophy does not revolve around verbal debates.

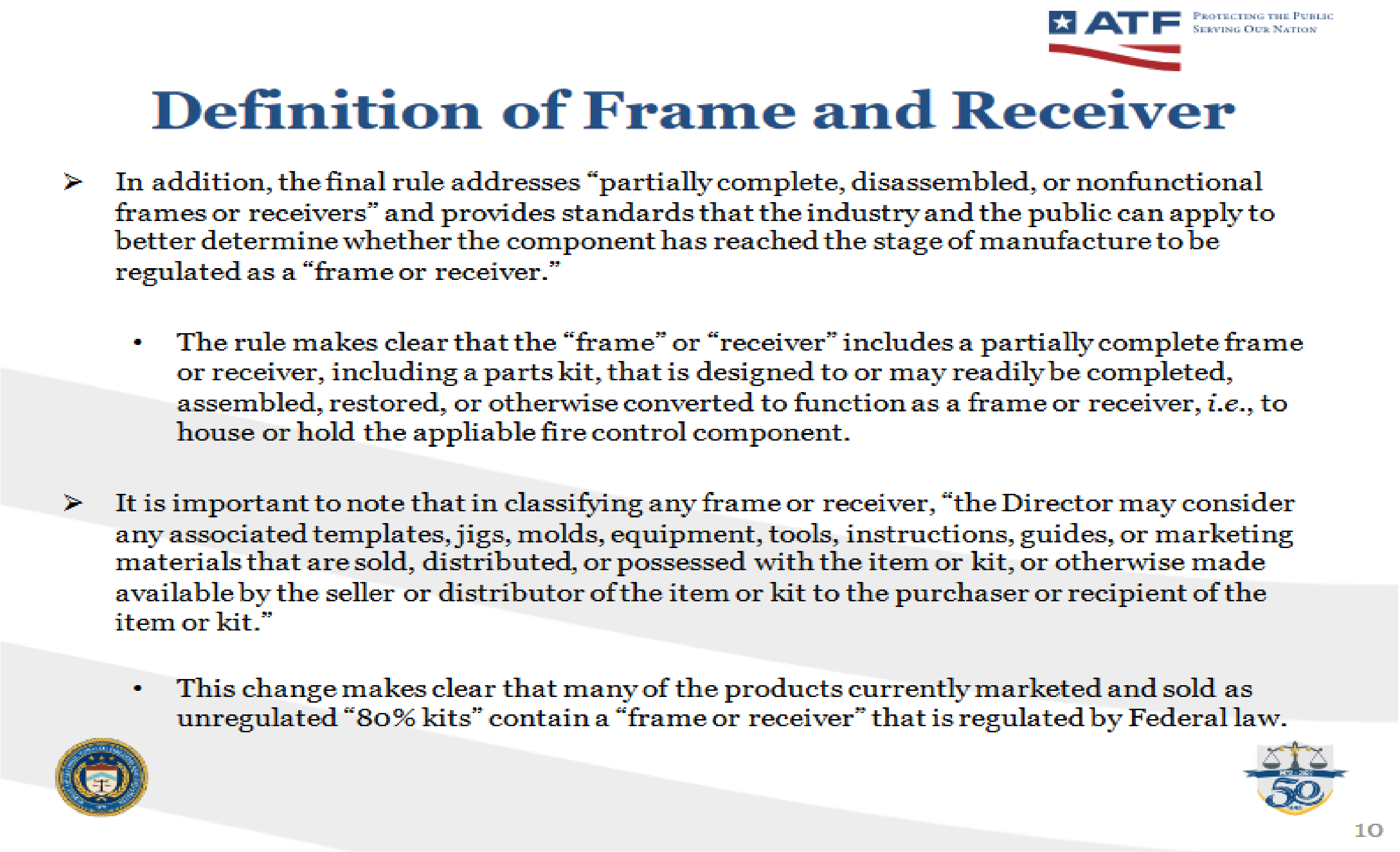
The end point is that this country has at least 40% of the world's private firearms, averaging more guns than people, and yet there are people who actually believe they can somehow keep all those weapons out of someone's hands, not to mention that giving up your most practical means of defense will essentially put you in the same position as a Kulak in the USSR, but I digress.
Even if full scale gun control were to take place, you would still be seeing a lot of criminal activity with firearms by people who make their own, those stashed away for just such an event, or even smuggled in from out of state/country and put on the black market.
Now into some of the legal questions that may be asked about this.

Just a disclaimer, this book will not be covering 3D printed firearms or AR pistols, as I lack any experience in those fields to make a guide on them.

WHAT ARE THE LAWS?

Producing your own homemade firearm is completely legal, however, if it falls under the category of something like a short barrel rifle, it may require certain permits and licensing by the feds. I can't say if that's the case or not as I've never attempted to make one before, so just try not to have a rifle stock on a gun you have with a barrel less than 16 inches long.
For the sake of keeping it simple, I will only cover making an AR15 as a rifle.

The only catch to making a homemade firearm is that you cannot legally sell or distribute it, otherwise you require to abide to the same regulations any other gun manufacturer would.


ATF
Protecting the Public
Serving Our Nation

Definition of Frame and Receiver

- In addition, the final rule addresses "partially complete, disassembled, or nonfunctional frames or receivers" and provides standards that the industry and the public can apply to better determine whether the component has reached the stage of manufacture to be regulated as a "frame or receiver."
    - The rule makes clear that the "frame" or "receiver" includes a partially complete frame or receiver, including a parts kit, that is designed to or may readily be completed, assembled, restored, or otherwise converted to function as a frame or receiver, *i.e.*, to house or hold the appliable fire control component.
- It is important to note that in classifying any frame or receiver, "the Director may consider any associated templates, jigs, molds, equipment, tools, instructions, guides, or marketing materials that are sold, distributed, or possessed with the item or kit, or otherwise made available by the seller or distributor of the item or kit to the purchaser or recipient of the item or kit."
    - This change makes clear that many of the products currently marketed and sold as unregulated "80% kits" contain a "frame or receiver" that is regulated by Federal law.

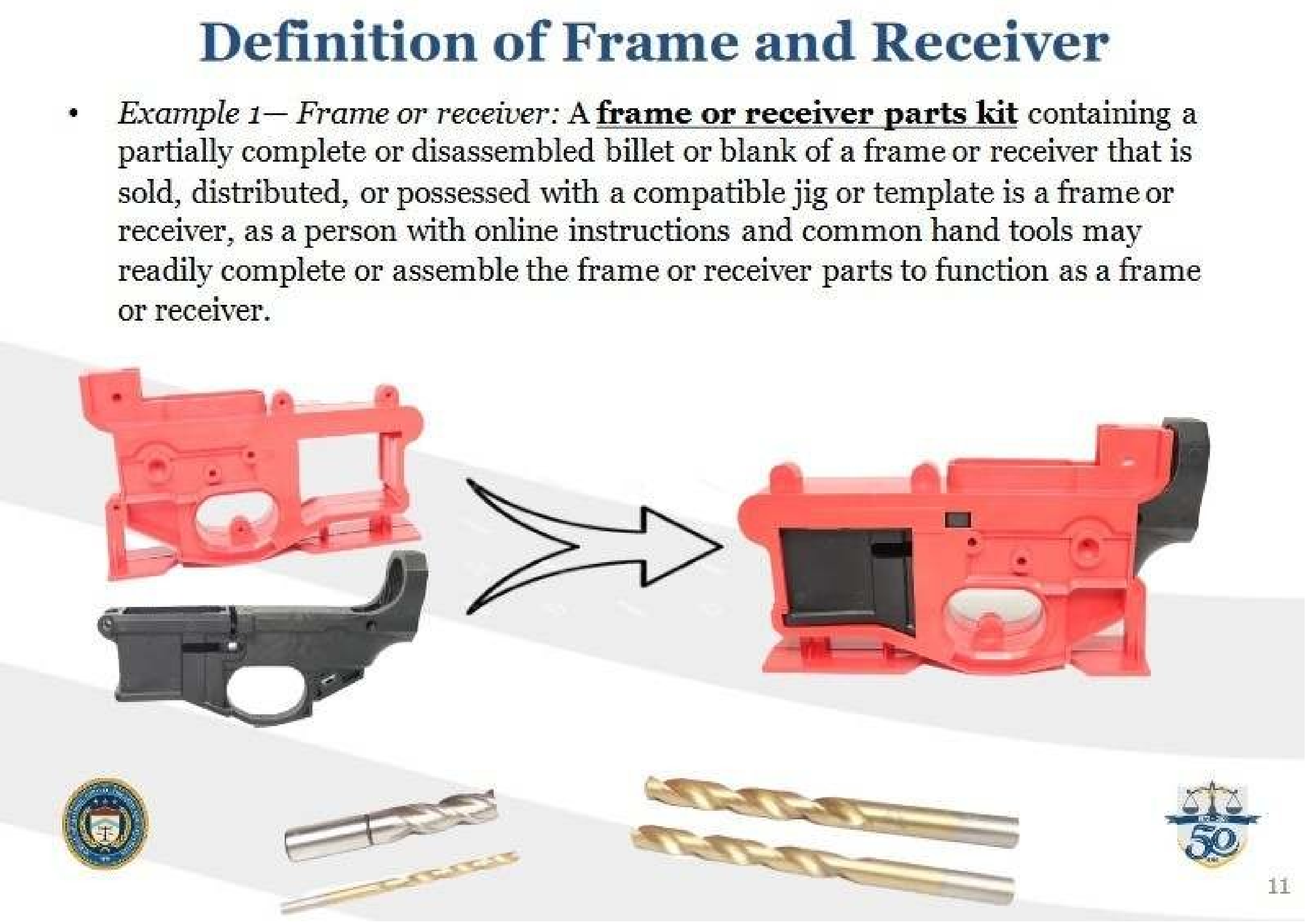
10

If it is solely for your personal use, then it is completely legal.

“But I Heard “Ghost guns” Were Being Regulated”

I’ve noticed a common phenomenon among gun control advocates and not knowing/reading about a single gun law in this country.

While doing research to find any more details about the ATF’s Final Rule, I came across several articles that implied the ATF had finally done something against ghost guns, but that couldn’t be further from a the truth if you actually read the document yourself. Here are the most relevant parts of the rule for this.

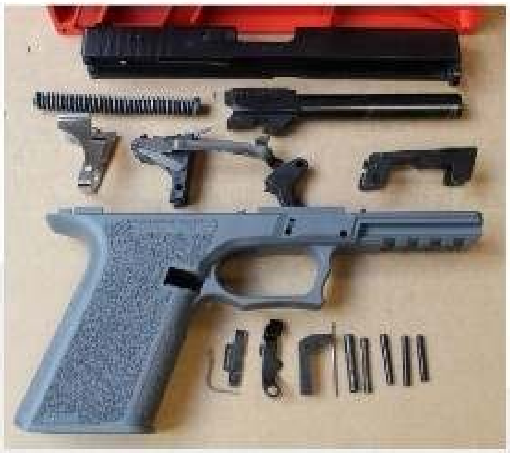


Definition of Frame and Receiver

- *Example 1— Frame or receiver:* A **frame or receiver parts kit** containing a partially complete or disassembled billet or blank of a frame or receiver that is sold, distributed, or possessed with a compatible jig or template is a frame or receiver, as a person with online instructions and common hand tools may readily complete or assemble the frame or receiver parts to function as a frame or receiver.

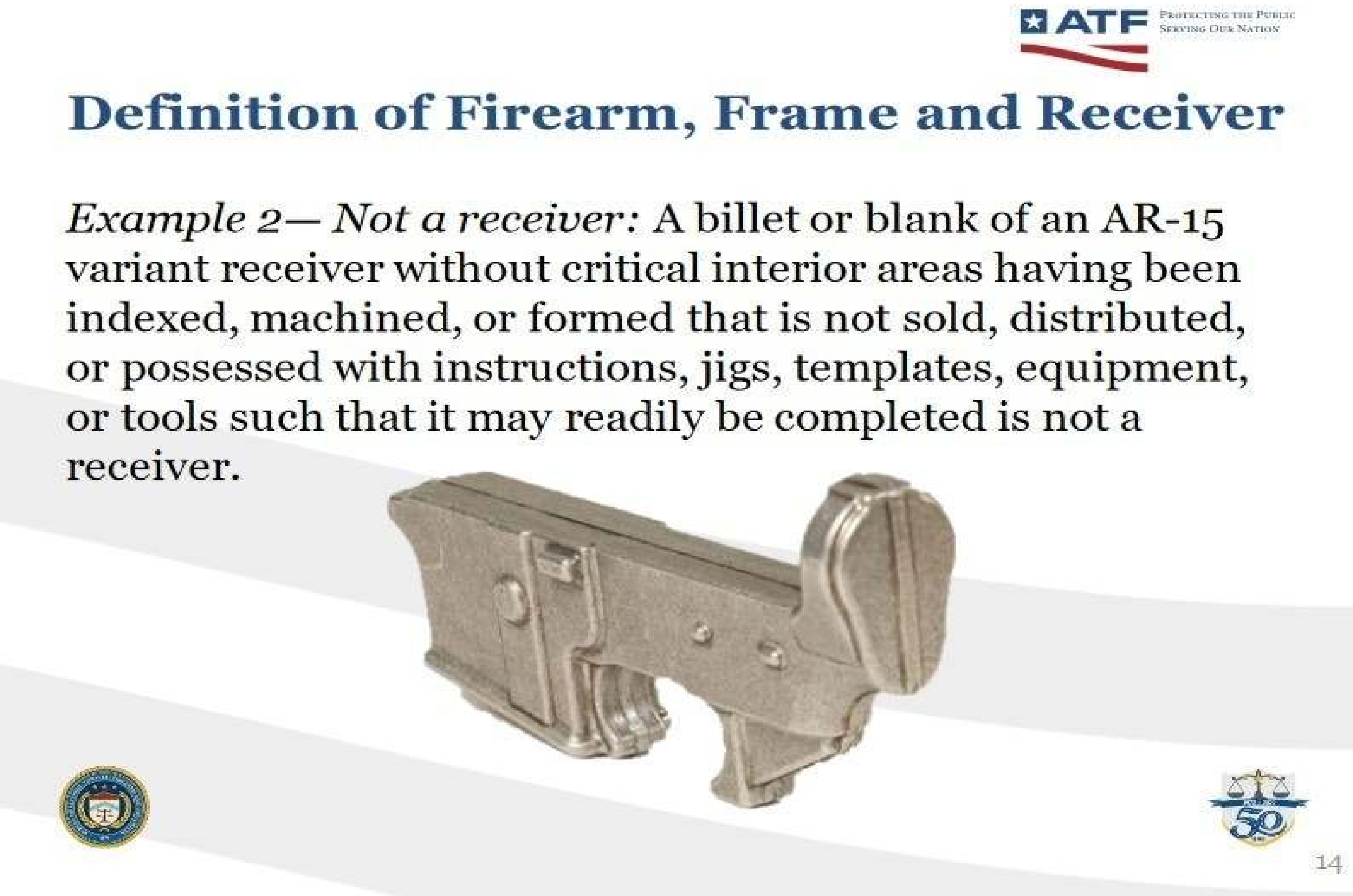
Definition of Firearm

- The rule clarifies that the definition of "firearm" includes a **weapon parts kit** that is designed to or may readily be completed, assembled, restored, or otherwise converted to expel a projectile by the action of an explosive.



Definition of Firearm, Frame and Receiver

- The rule makes clear that the terms **shall not** include a forging, casting, printing, extrusion, unmachined body, or similar article that has not yet reached a stage of manufacture where it is clearly identifiable as an unfinished component part of a weapon (e.g., unformed block of metal, liquid polymer, or other raw material).



Definition of Firearm, Frame and Receiver

Example 2— Not a receiver: A billet or blank of an AR-15 variant receiver without critical interior areas having been indexed, machined, or formed that is not sold, distributed, or possessed with instructions, jigs, templates, equipment, or tools such that it may readily be completed is not a receiver.

If you pay attention to it, you can see they have only decided to target kits, and lower-jig combos.
Initially they did plan on attempting to regulate 80% lowers as a whole, but it would seem there were some changes prior to the rule being approved.

Again, I am not a legal expert, but the wording seems clear enough to me to understand that if you wish to obtain your own unserialized firearm without the hassle of background checks or an ffl getting involved, just avoid complete kits for both rifles and pistols, and just buy your parts separately.

I assume all in one order would be fine since that doesn't seem to be mentioned in the rule, but if you wanna be safe, just try buying parts from different sellers/distributors and avoid sets that include the lower, and both the jig and drill bits to complete it, such as most of the kits Polymer80 sells.

However, there are some restrictions on just what you can legally do with an 80% lower, as of current laws anyway.

Those include:

- Not being a felon, as a felon machining an 80% itself would be its own crime
- No sale of finished firearm receiver unless you become a registered gun manufacturer
- No conversion of your rifle/pistol to full auto
- Finished firearm must meet the qualifications of a pistol or rifle, as it is prohibited to make anything relating to a title II firearm such as a short barreled rifle without the licensing to do so

Now that should about summarize the federal laws on 80% lowers and homemade firearms in generals.
A bigger problem is to summarize the current laws regarding anti-gun states and where they put 80% lowers in terms of legality.

In some of the states where compliance appears to be a 'virtue', there are some things I simply cannot cover due to lack of resources and lack of time, so take these notes with a grain of salt and do your own research prior to doing anything, assuming you live in these miserable wastelands.

California:

At the moment, it would seem that 80% lowers and homemade firearms are technically “legal”, however, the catch is that they require to be serialized after they are considered functioning firearms, and there also seems to be some kind of application requirement for said serial number, although finding the specifics are a bit tedious.
To assist in the info on this in particular, I suggest reading through this article by 80percentarms.

https://www.80percentarms.com/pages/california-laws-80-lower

I do not reside a state of bureaucracy, so I advise finding sources that specialize in such states.

Connecticut:

Banned the manufacture of items used for the purpose of assembling a firearm without a serial number.
(HB7219)
I had an easier time finding the source on this.

(24) "Frame or lower receiver" means the part of a firearm that provides the action or housing for the hammer, bolt or breechblock and firing mechanism, and includes a frame or lower receiver blank, casting or machined body that requires further machining or molding to be used as part of a functional firearm, and which is designed and intended to be used in the "assembly", as that term is defined in section 29-36, as amended by this act, of a functional firearm.

Sec. 2. Section 29-36 of the general statutes is repealed and the following is substituted in lieu thereof (*Effective October 1, 2019*):

(a) No individual shall complete the manufacture or assembly of a firearm without (1) obtaining a unique serial number or other mark of identification from the Department of Emergency Services and Public Protection pursuant to section 3 of this act, and (2) engraving upon or permanently affixing to the firearm such serial number or other mark in a manner that conforms with the requirements imposed on licensed importers and licensed manufacturers of firearms pursuant to 18 USC 923(i), as amended from time to time, and any regulation adopted thereunder.

a unique serial number or other mark of identification pursuant to subsection (a) of this section.

(c) Not later than thirty days after an individual completes manufacturing or assembling a firearm pursuant to this section, such individual shall notify the Department of Emergency Services and Public Protection and provide any identifying information to said department concerning the firearm and the owner of such firearm, in a manner provided by the Commissioner of Emergency Services and Public Protection.

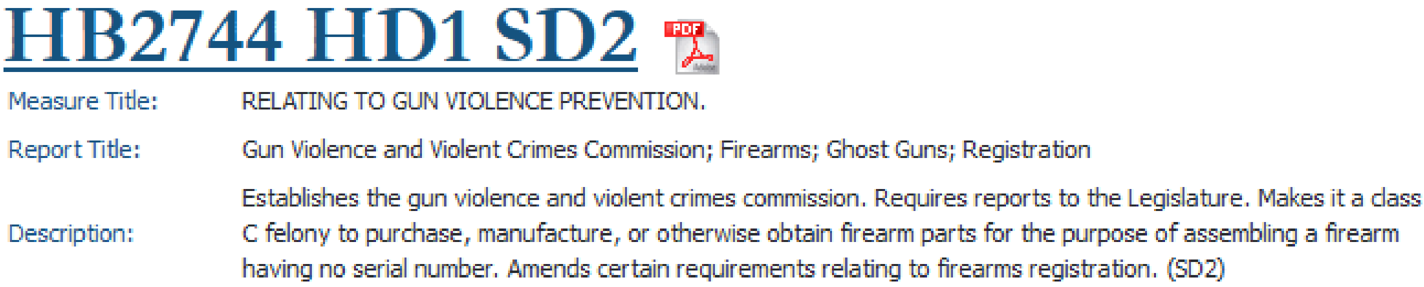
[(a)] (d) No [person] individual shall remove, deface, alter or obliterate the name of any maker or model or any maker's number, unique serial number or other mark of identification on any firearm. [as defined in section 53a-3.] The possession of any firearm upon which any identifying mark, number or name has been removed, defaced, altered or obliterated shall be prima facie evidence that the [person] individual owning or in possession of such firearm has removed, defaced, altered or obliterated the same.

Statement of Purpose:

To ban guns without serial numbers and regulate those which are sold in a form requiring the purchaser to finish assembly or that are homemade or 3-D printed.

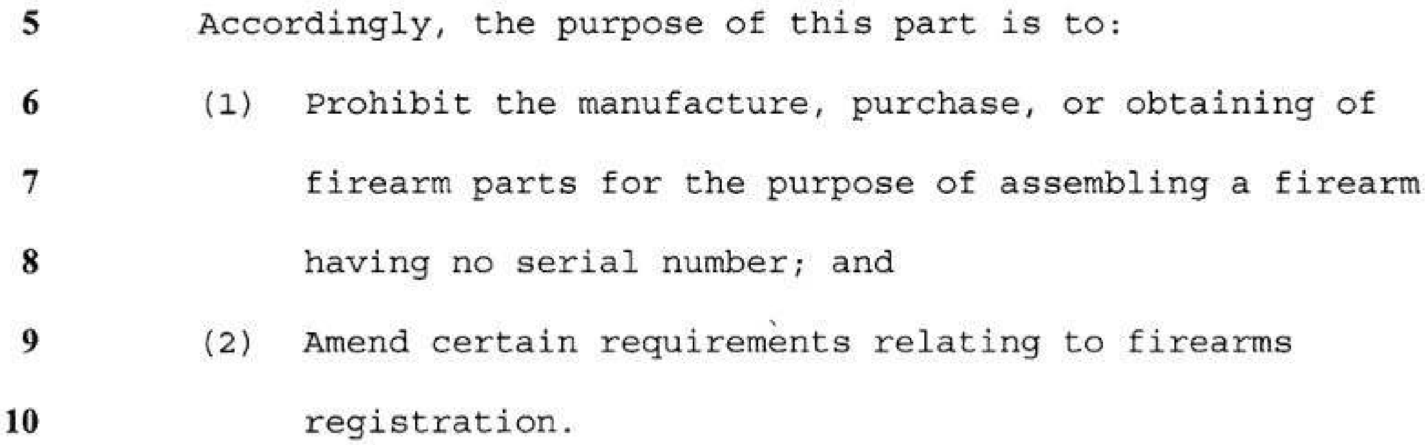
https://www.cga.ct.gov/2019/TOB/h/pdf/2019HB-07219-R00-HB.PDF

Hawaii:
(HB2744 HD1 SD2)



HB2744 HD1 SD2

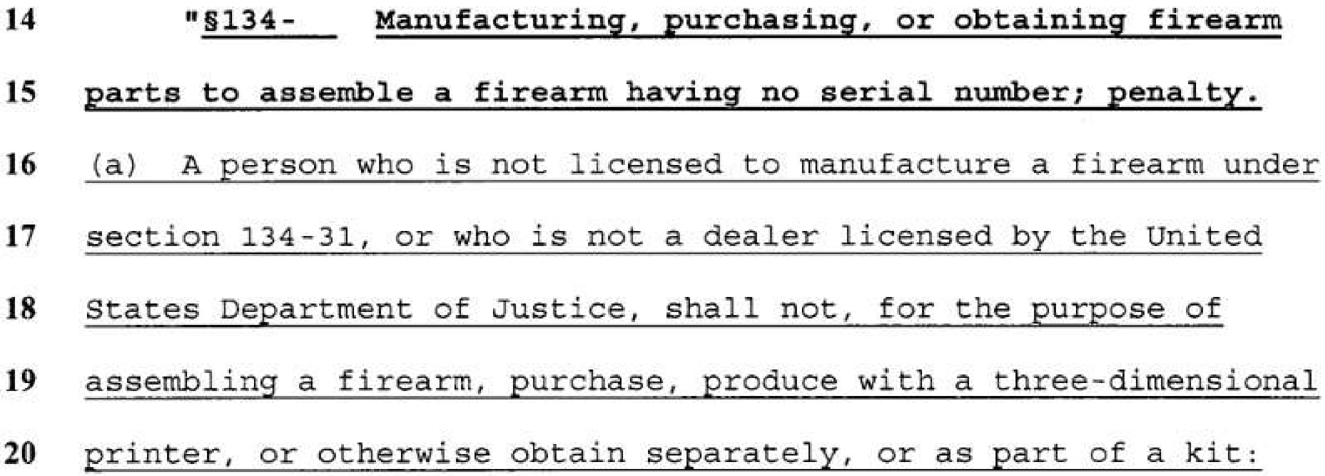
Measure Title:	RELATING TO GUN VIOLENCE PREVENTION.
Report Title:	Gun Violence and Violent Crimes Commission; Firearms; Ghost Guns; Registration
Description:	Establishes the gun violence and violent crimes commission. Requires reports to the Legislature. Makes it a class C felony to purchase, manufacture, or otherwise obtain firearm parts for the purpose of assembling a firearm having no serial number. Amends certain requirements relating to firearms registration. (SD2)



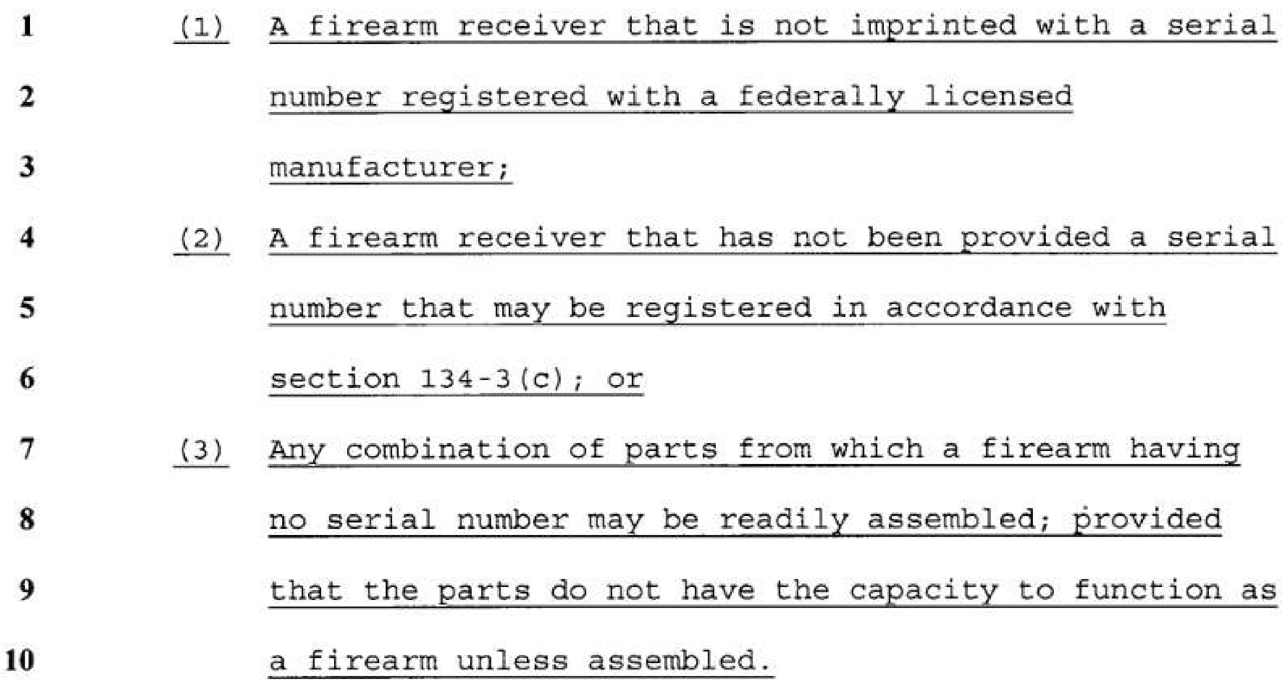
Accordingly, the purpose of this part is to:

(1) Prohibit the manufacture, purchase, or obtaining of firearm parts for the purpose of assembling a firearm having no serial number; and

(2) Amend certain requirements relating to firearms registration.



"§134-   Manufacturing, purchasing, or obtaining firearm parts to assemble a firearm having no serial number; penalty. (a) A person who is not licensed to manufacture a firearm under section 134-31, or who is not a dealer licensed by the United States Department of Justice, shall not, for the purpose of assembling a firearm, purchase, produce with a three-dimensional printer, or otherwise obtain separately, or as part of a kit:



(1) A firearm receiver that is not imprinted with a serial number registered with a federally licensed manufacturer;

(2) A firearm receiver that has not been provided a serial number that may be registered in accordance with section 134-3(c); or

(3) Any combination of parts from which a firearm having no serial number may be readily assembled; provided that the parts do not have the capacity to function as a firearm unless assembled.

Maryland:

Requires finished 80% lowers to be serialized and give the serial number to state police in order to legally possess.

(Could not find a government cited document on this.)

Rhode Island:

According to a local news station, Governor Raimondo had signed a “ghost gun” bill which seeks to ban both 3D printed and unserialized firearms.

https://www.wpri.com/news/politics/raimondo-to-sign-ghost-gun-bill-tuesday-afternoon/

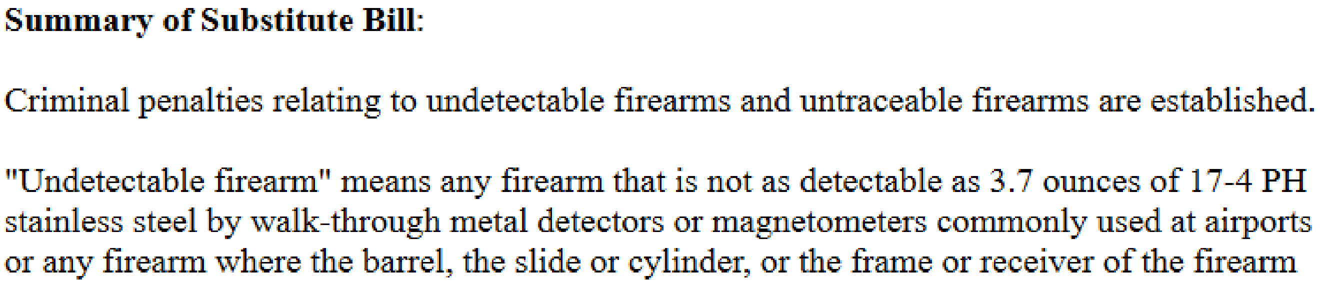
New Jersey:

“Establishes crime of purchasing components to unlawfully manufacture untraceable firearms.”
(Bill A4791)

New York:

Attorney General was sending cease and desist letters to 80% lower companies to stop all sales and shipments of orders, so I would assume that’s essentially a ban.

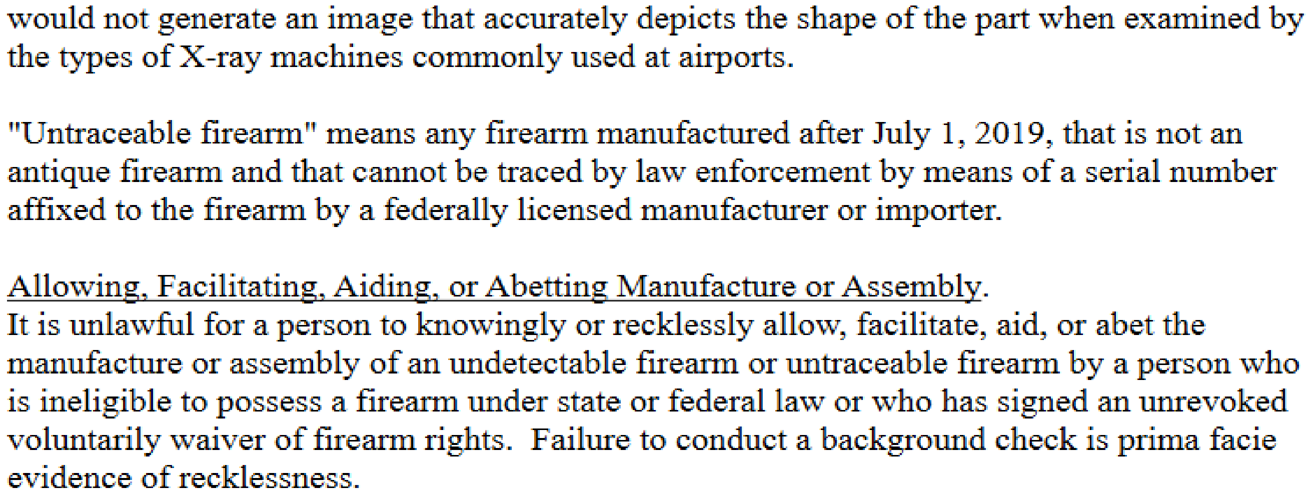
Washington (State):
(HB 1739)



Summary of Substitute Bill:

Criminal penalties relating to undetectable firearms and untraceable firearms are established.

"Undetectable firearm" means any firearm that is not as detectable as 3.7 ounces of 17-4 PH stainless steel by walk-through metal detectors or magnetometers commonly used at airports or any firearm where the barrel, the slide or cylinder, or the frame or receiver of the firearm



would not generate an image that accurately depicts the shape of the part when examined by the types of X-ray machines commonly used at airports.

"Untraceable firearm" means any firearm manufactured after July 1, 2019, that is not an antique firearm and that cannot be traced by law enforcement by means of a serial number affixed to the firearm by a federally licensed manufacturer or importer.

Allowing, Facilitating, Aiding, or Abetting Manufacture or Assembly.
It is unlawful for a person to knowingly or recklessly allow, facilitate, aid, or abet the manufacture or assembly of an undetectable firearm or untraceable firearm by a person who is ineligible to possess a firearm under state or federal law or who has signed an unrevoked voluntarily waiver of firearm rights. Failure to conduct a background check is prima facie evidence of recklessness.

Then I assume the laws get even more local in certain places, because I often see when reading through the description of an 80% lower that they'll list places where they are not legally allowed to ship, and that list usually consists of the aforementioned states, and even certain cities within states such as San Francisco City, Los Angeles City, San Diego County, Illinois Oakland City, Washington D.C., etc.
So do keep in mind that although 80% lowers are legal on the federal level, not all states are as interested in having their residents get into home gunsmithing.

Any and all of these gun laws can change, so do your research prior to ordering anything.
Once again, I am glad I reside in a fly-over state.

Now if you have never heard of an 80% lower before, I will explain just why they are so important to easy entry into home gunsmithing.

(Although manufacturing your own firearm for personal use is legal in most states, you cannot legally make one if it constitutes an NFA weapon, in this case being a short barrel rifle. And you can't make it full auto either as of 1986.
Thanks, Reagan.)

WHAT IS AN 80% LOWER?

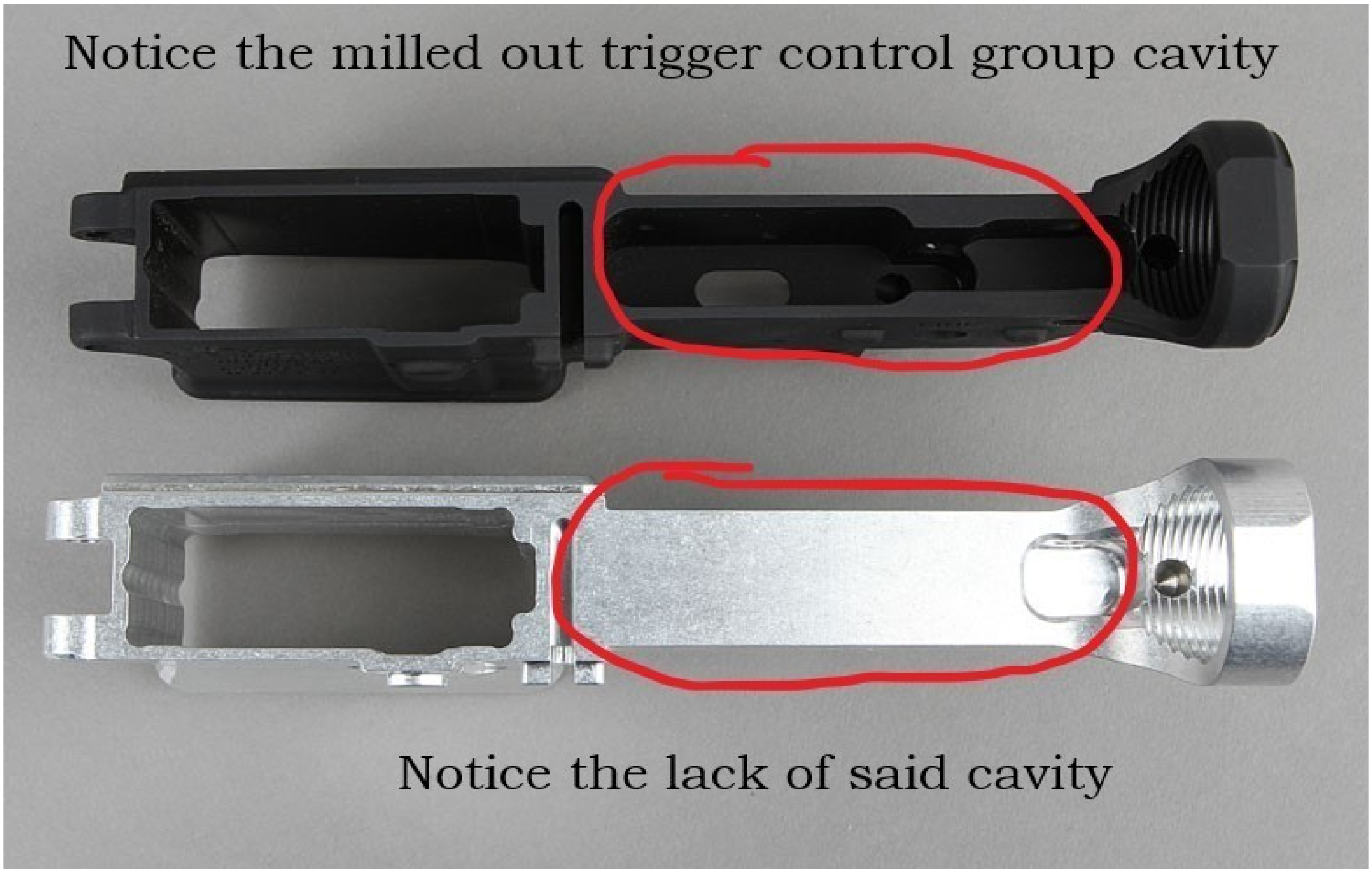
It is typically a marketing term which means a lower receiver that is roughly 80% complete, and therefore not able to function as a finished firearm.
The buyer (you) requires to additionally mill out the pin holes for the trigger components and the safety selector, along with the cavity for the fire control group (Trigger, sear, hammer, etc.)

The reason 80% lowers aren't classified as guns is for two reasons I can think of.

1. On their own, they can't qualify as a kit, and are therefore exempt from regulation like that in FINAL RULE 2021R-05F. I believe that's the case anyway.

2. The term "80%" is a marketing one to imply a piece of material (Polymer or variants of aluminum) that has been roughly completed, but not quite ready to be used in a functioning firearm, and therefore requires additional work by the buyer to complete before it is technically a "firearm" by ATF definition.

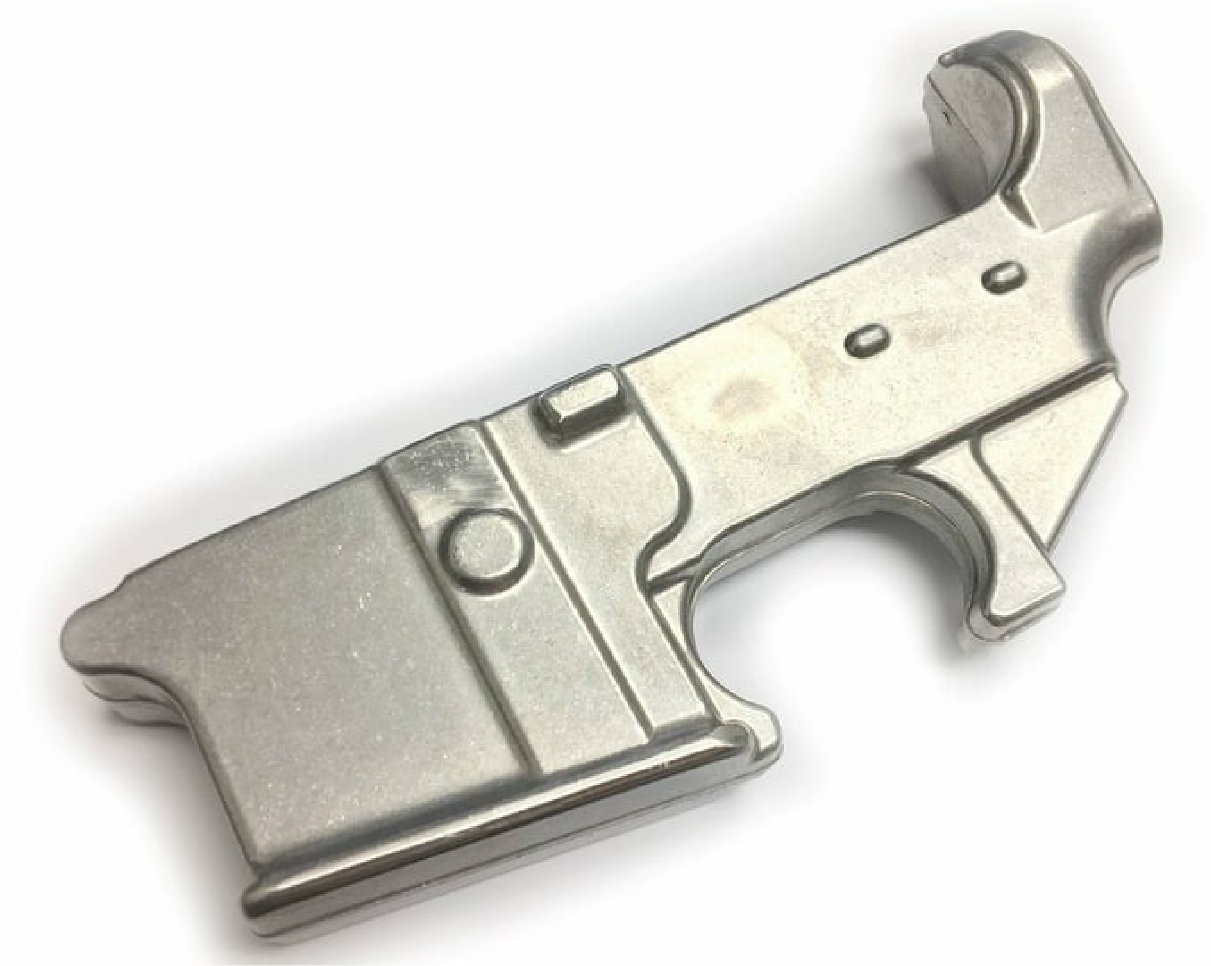
"*Any weapon (including a starter gun) which will or is designed to or may readily be converted to expel a projectile by the action of an explosive; The frame or receiver of any such weapon; Any firearm muffler or firearm silencer; or Any destructive device.*"


Notice the milled out trigger control group cavity
Notice the lack of said cavity

Only the top lower receiver in the image above classifies as a "firearm", unless the bottom is packaged with a jig, drill bits, or is included in a full build kit, according to my knowledge anyway.

Going back to the example listed on the ATF's current ruling, I wanted to also briefly mention alternatives to 80% lowers for the more advanced in gunsmithing.

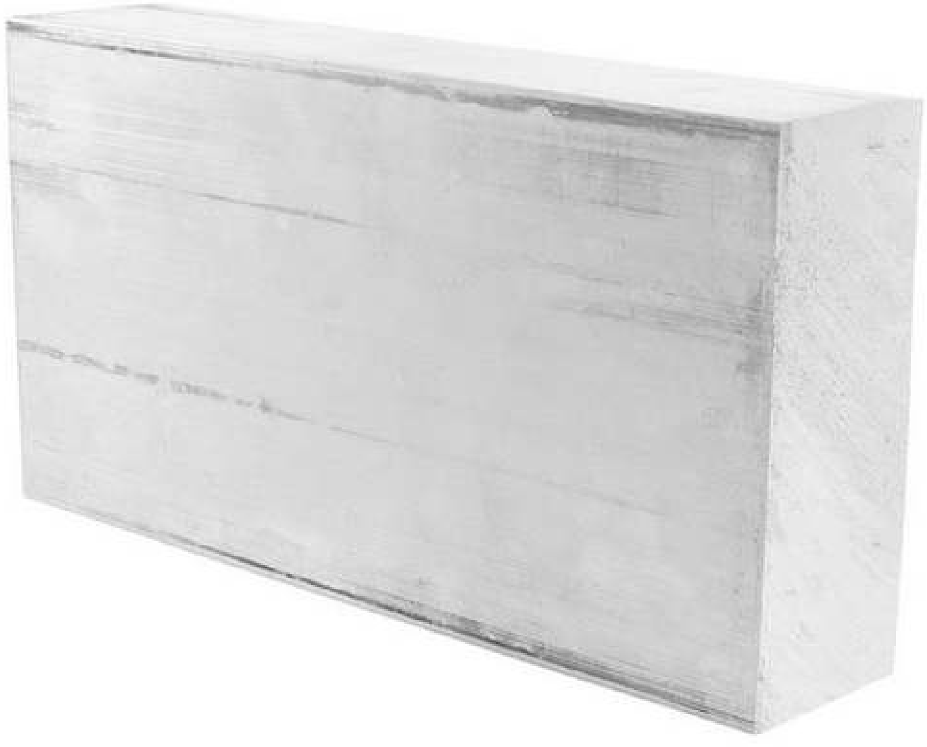
This also aligns with my point on gun control being futile to any who have any knowledge of how firearms actually work, because there's a very simple mechanical skill to it all that anyone with experience using a cnc can get behind.



This is a “20% lower”.

A forged casting in the shape and size of an AR15 lower receiver, but nothing is machined.

Going further, we have the greatest mockery to gun control yet.



Meet the “0% lower”.
A block of raw aluminum sized to the specs required to machine it to the proper shape of an AR15 lower receiver.

There are people who are so out of touch with things that they believe firearms can only be produced in a factory, without realizing the same things in those factories are used for jobs in workshops and houses of machinists everywhere.

These two certainly require more work to complete than their mostly finished counterpart, but they are still an option if one desires more of a challenge. But due to my lack of experience in the more advanced area of this, I’m just mentioning them here for a point.

If there is ever a time in which the ATF comes after 80% lowers as a whole, there will be fallback options for anyone with the machines and know how to produce their own guns, even if that regulation goes as far as the 20% lower, unless you really believe you can outright ban blocks of metal.

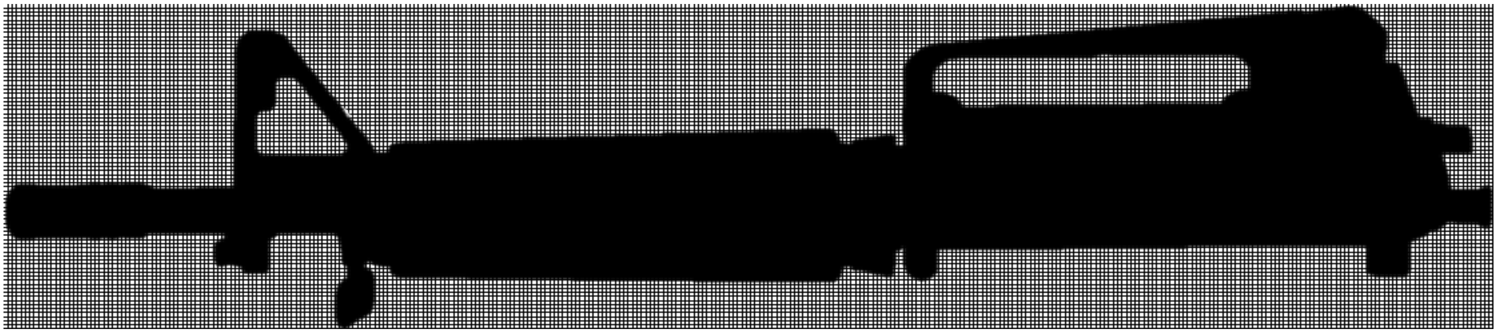
There are plenty of forum threads that can be found for these subjects and advice from men with more experience in the field, but I feel no need to mention any by name in case someone ever decides to try using this book as something to assist in their anti-gun crusade.

With my rant over, we may proceed to just what and how you go about building your own homemade rifle.

INTRODUCTION TO TERMINOLOGY

This is the 'lower assembly' of the AR15 (The bottom half of the rifle).

It consists of the lower receiver, which houses the fire control group (trigger, hammer, sear, disconnector, etc), the pistol grip, magazine catch, safety selector switch, buffer tube & stock, and bolt release. Not to mention all the pins and springs.

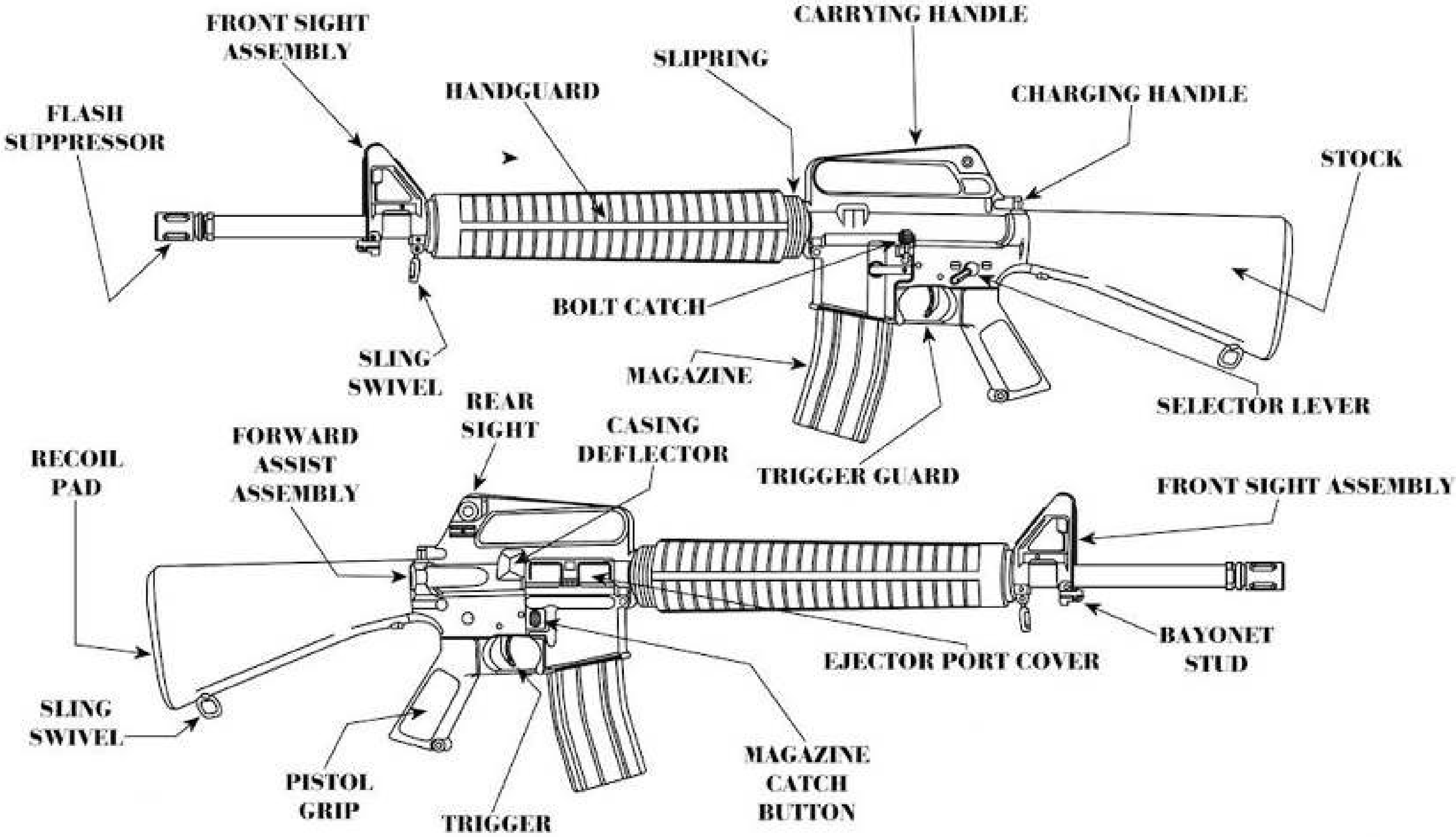


This is the 'upper assembly' (The top half).

It consists of the upper receiver, which houses the bolt carrier group, firing pin, forward assist, along with the barrel, gas tube & block, muzzle device, handguard, dust cover, and charging hand

Also not to mention all the additionally smaller components.

One issue I've seen that people tend to have when first getting into firearms is not understanding the terminologies of certain parts they don't know about, so these should help with that.



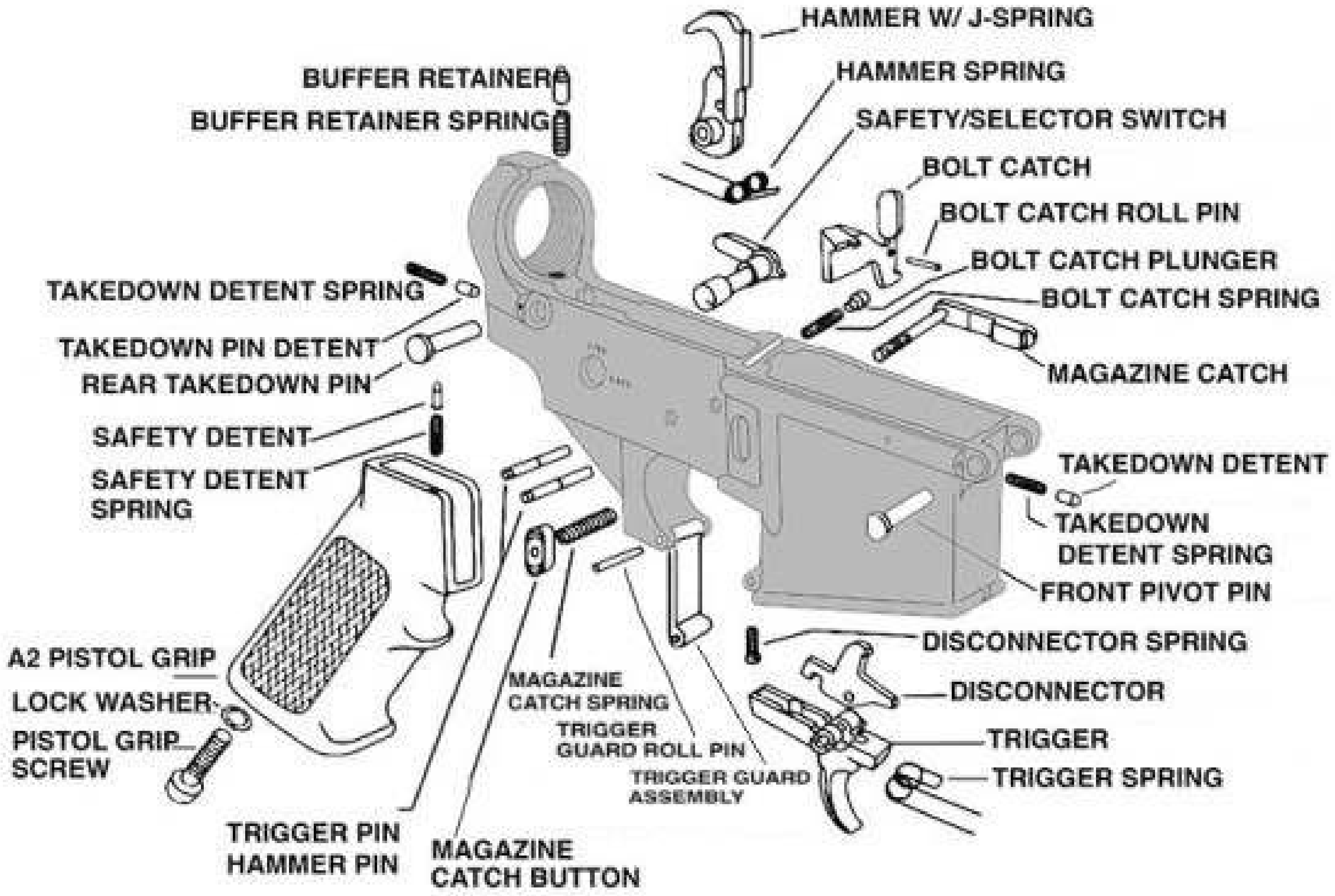
Please remember that AR15s and M16s are not the same rifle functionality wise, they are part of the same rifle platform, and share compatibility with the same parts, so this diagram also applies to civilian ARs.

LOWER RECEIVER PARTS

Starting with the lower receiver assembly (the bottom half of the gun), I will list out all the components required to fully assemble this section of the gun along with the additional items required to finish milling the 80% lower, and then cover the upper receiver assembly.

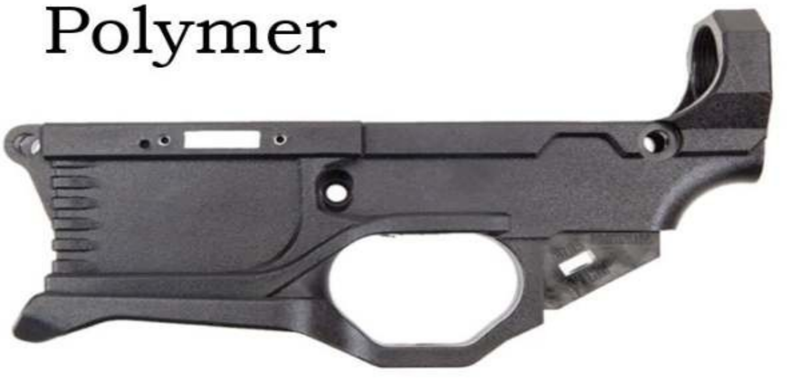
- 80% lower receiver
- Rifle stock/pistol brace (depending on the build)
- Buffer tube sized for stock/pistol brace
- Buffer (weight), and spring, also sized to specific build
- Castle nut
- Receiver end plate
- Buffer retainer & retainer spring
- Pistol grip
- Pistol grip screw & washer
- Trigger guard (optional by lower used)
- Trigger guard roll pin (also optional)
- Trigger & trigger spring
- Hammer & hammer spring
- Hammer & trigger pins
- Disconnector & disconnector spring
- Bolt catch, bolt catch roll pin, bolt catch plunger & plunger spring
- Magazine catch, magazine catch button & magazine catch spring
- Safety selector, safety selector detent & safety detent spring
- Pivot pin, pivot pin detent & pivot detent spring
- Takedown pin, takedown pin detent & takedown detent spring

(Components of the lower assembly).

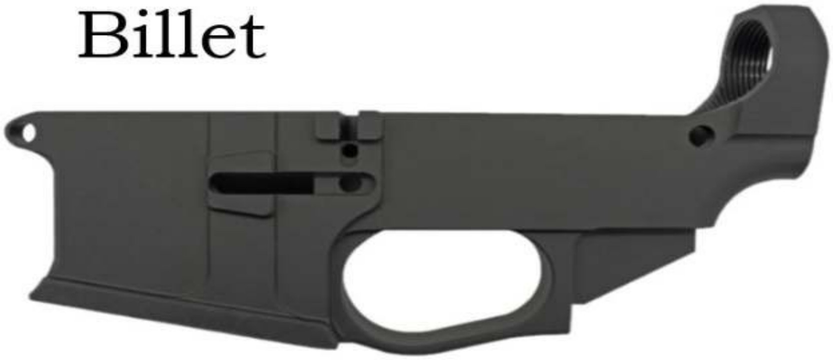


Firstly, I’ll cover the 80% variants for this project and why the trigger guard pieces are considered optional. Depending on just what kind of 80% lower you get will determine if you would require a trigger guard the roll pin or not.

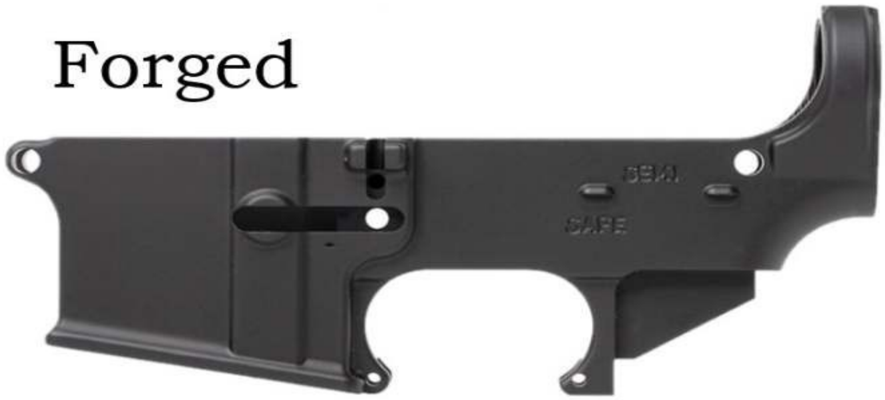
Polymer



Billet



Forged



Polymer lowers pretty much always have a built in trigger guard.

Billet lowers will usually have a built in guard as well, but I've seen a few that don't include that feature, so pay attention on just what you buy.

Then we have the forged, which I don't believe ever include a built in trigger guard.

As for the pros and cons of all without getting too into it because you can find guides online going over which may be better for you, I'll keep it simple.

Which is better?
Like most things in the gun world, it depends.

Often the case is that polymer is easier to mill out than both types of commercially available aluminum, that comes at the expense of a lower lifespan when under constant use.
I would suggest polymer if you're looking for more a range toy you can have fun with on occasion, but maybe not something for the long term if you're planning on using it for well over a few decades.

Billet and forged are both significantly more durable overall, as for which is more so, forged often gets that reputation among the two, although it’s not that noticeable unless you intend to put both through torture tests.

As for the aluminum the lower is made of, there are two types which I am aware of: 6061-T6 and 7075-T6.

The main difference is that 6061-T6 is a softer type and easier to mill out than its harder 7075 counterpart, however some would argue that 7075 is better for the long hall.

6061 is said to be more corrosion resistant on its own, but who actually uses a raw aluminum lower when there are so many options for anodizing/corrosion coating available?

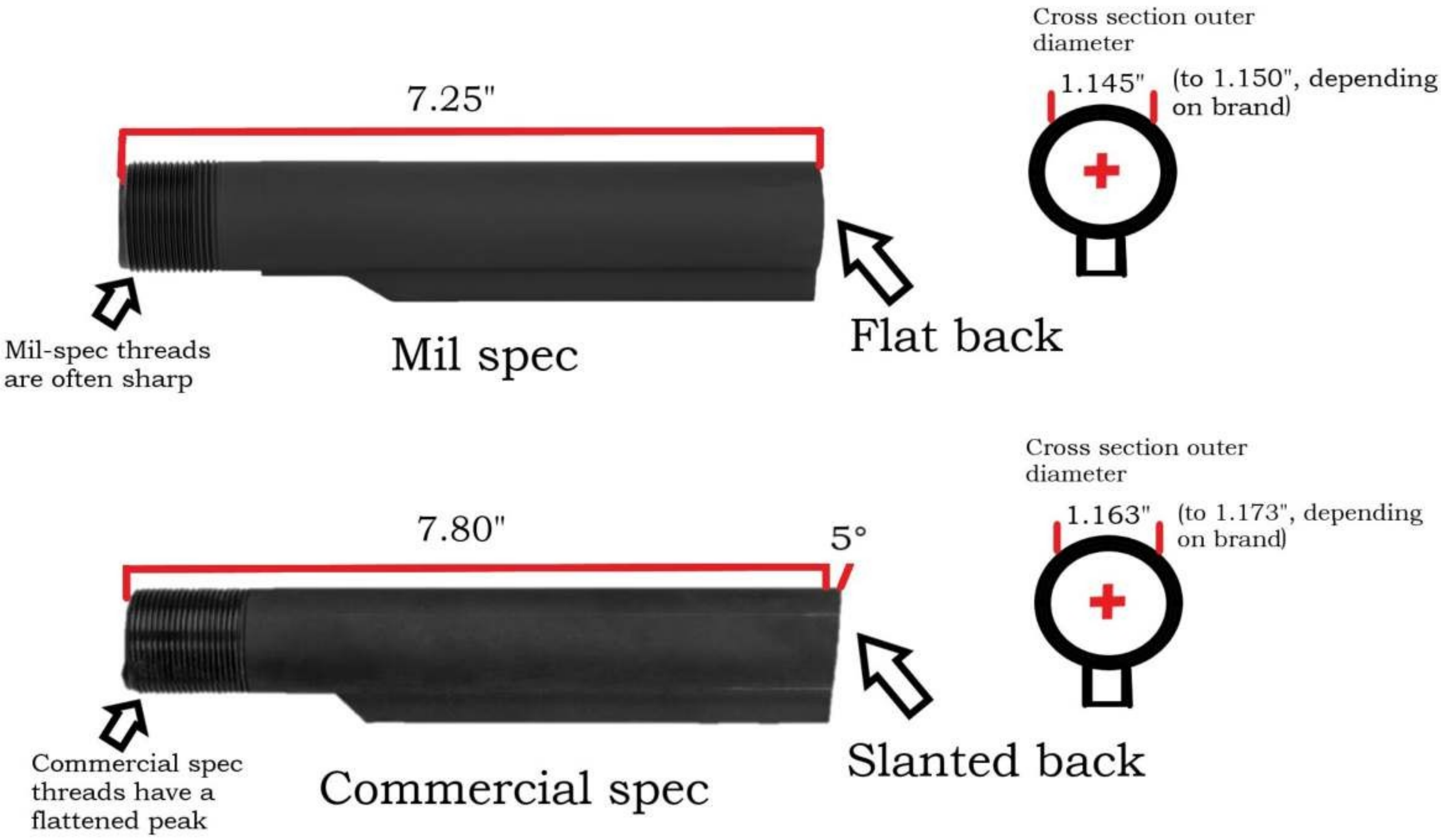
I’ll let you do the research on just which you feel suits you better since I can’t tell you what *your* preferences are.

Hopefully this gives some basic insight to help you before making a purchase.

Another important thing to take note of are the specs of your 80% lower. There is commercial spec and mil-spec, which relates to the buffer tube dimensions.

I assume most are mil-spec by default, but always check before making your purchase or you’re in for a rough time when assembling your rifle.

Buffer Tubes & weights


Cross section outer diameter
1.145"
(to 1.150", depending on brand)
7.25"
Mil-spec threads are often sharp
Mil spec
Flat back
Cross section outer diameter
1.163"
(to 1.173", depending on brand)
7.80"
5°
Commercial spec threads have a flattened peak
Commercial spec
Slanted back

Do not interchange the two or their stocks.

(Milspec and commercial tubes are NOT interchangeable with their respective stocks.)

Personally I opt for the mil-spec just because, but again, the choice is ultimately yours on which you feel suits your needs more.

Price wise, they're essentially the same most places I've seen.

Moving on, we go to the weights and then the springs.

(Not covering piston systems, just direct impingement ones.)

What are buffers (the weights) for?

The AR15 is a gas operated firearm, and with that it requires a gas tube (more on that in the upper section later).

These buffers work along with these gas tubes like so:

- Absorb the energy of the bolt carrier group as it compresses the spring inside the tube & push it back to chamber another round.

  (The gas tube forces gas pressure up a gas port on the barrel, down the tube, then into the gas key in the bolt carrier which in turn goes back and extracts the spent round casing. The buffer and spring is what the bolt carrier pushes back into after it unlocks and the buffer presses the spring to its limit, causing the spring to move the bolt carrier forward again, thus chambering another round into battery.)

- (Secondary benefit) Absorb and reduce felt recoil for the shooter.

Before getting into the exact details of just what you should consider getting, here’s a visual comparison between the main ones, not including the pistol caliber variant(s).

Consists of three steel weights

Standard carbine buffer
Weight: Around 3.0 oz
Reciprocal weight: About 1.9 oz

Consists of two steel weights and one tungsten weight

H1 buffer
Weight: Around 3.7 oz
Reciprocal weight: About 2.8 oz

Consists of two tungsten weights and one steel weight

H2 buffer
Weight: Around 4.6 oz
Reciprocal weight: About 3.5oz

Consists of three tungsten weights

H3 buffer
Weight: Around 5.4 oz
Reciprocal weight: About 4.3 oz

Consists of five steel weights and one spacer

Rifle/A2 buffer
Weight: Around 5.1 oz
Reciprocal weight: About 3.5 oz
(Only use for fixed rifle stocks.)

(The look of the buffers shown is not an indicator of what they are, just for visual example of a few I found. Any of these can be customized by replacing the weights inside with lighter/heavier options.)

(Rifle and carbine buffers/stocks are NOT interchangeable.)

The point of varying weights for your buffer tube is to apply the most optimal cyclical function in your rifle/pistol set up.

I summarized the process of just how buffer weights work, so keeping that in mind you should be able to understand these notes.

- Signs you need a heavier buffer weight:

  Your spent casings eject more towards the front of the gun than the back

  Your recoil feels punchy

  Noticeably faster wear on parts

- Signs you need a lighter buffer weight:

  Your spent casings eject towards you

  You experience constant jamming

  Weapon does not cycle rounds at all

Lighter weights cycle faster, and due to that they also reduce recoil less, and require lower grain weight ammunition, whereas heavier weights are essentially the opposite.

If your buffer is too light for your set up, you'll experience what is referred to as an "overgassed" rifle, where the gas pressure exceeds the weight of the buffer, causing excessive recoil and round cycling, additionally putting more wear on parts.

If the buffer is too heavy, you'll experience "short stroking" where the pressure doesn't move the buffer all the way back (or at all) into the tube, causing a jam while trying to eject a spent casing, and sometimes not allowing you to cycle a round at all.

A suggested way to test if a buffer weight works for your set up or not is to see if it allows your bolt to lock back every time the magazine is emptied.

Load one round into the mag, cycle it, and if it consistently locks back after a few tests it should be good.

A general rule of thumb most follow is getting the heaviest buffer that functions with your set up in particular, as the weight causes it to move slower and take more energy to move, causing a “smoother” operation of cycling.

I cannot cite any absolutes in particular, as all set ups can be different with the factors consisting of things like the buffer weight, the bolt carrier group, barrel length, type of ammo being shot, the gas tube length, gas port size, suppressors, etc.
This will only serve as a general idea of what to start with on your tests to see what fits the best with what you plan on making.

Another general rule, however, is that if you run larger calibers, such as 7.62x39mm, .450 Bushmaster, .50 Beowulf and the like, it is often suggested that heavier weights are pretty much essential.

Shorter barrels usually seem to need heavier buffers since the case extraction is more ‘violent’ in comparison to longer barrels.

Rule of thumb:

- Midlength to rifle gas tube with 18”+ barrel and no suppressor should be an H1
- Carbine to midlength gas tube with a 14.5” to 16” barrel and no suppressor should be H1 or H2
- The aforementioned *with* a suppressor should be an H2
- Carbine length gas tube with a barrel between 10.5 and 11.5” without a suppressor should be H2 or H3
- Aforementioned *with* a suppressor should be an H3
- Anything related to an AR pistol should consider H2, H3, or if you’re opting for a pistol caliber like 9mm, get a pistol caliber buffer (not shown in above diagram.)

This only covers a basic overview, as there are several other factors such as ammo weight and to a smaller extent, things like the weight of your bolt carrier.

This overview is based on rifles chambered in 5.56

For now, this should serve as a good overview before we come back to this subject later.

Don’t forget your buffer retainer and retainer spring, but most stock kits should come with those by default.

Carbine/fixed stocks

Moving from the last segment, there wasn't too much mentioned about rifle/fixed and carbine stocks.

As should already be mentioned, carbine and rifle/fixed stocks do not have interchangeable components and require their own separate parts in order to properly function.

Examples of carbine stocks such as my personal favorites would include:

Classic M4 style

Sopmod

Magpul MOE

With AR15s, there have been many new options for customization and options can at times seem limitless.

More examples of AR stocks:

FAB Defense survival stock

Minimalist

Magpul SL MOE

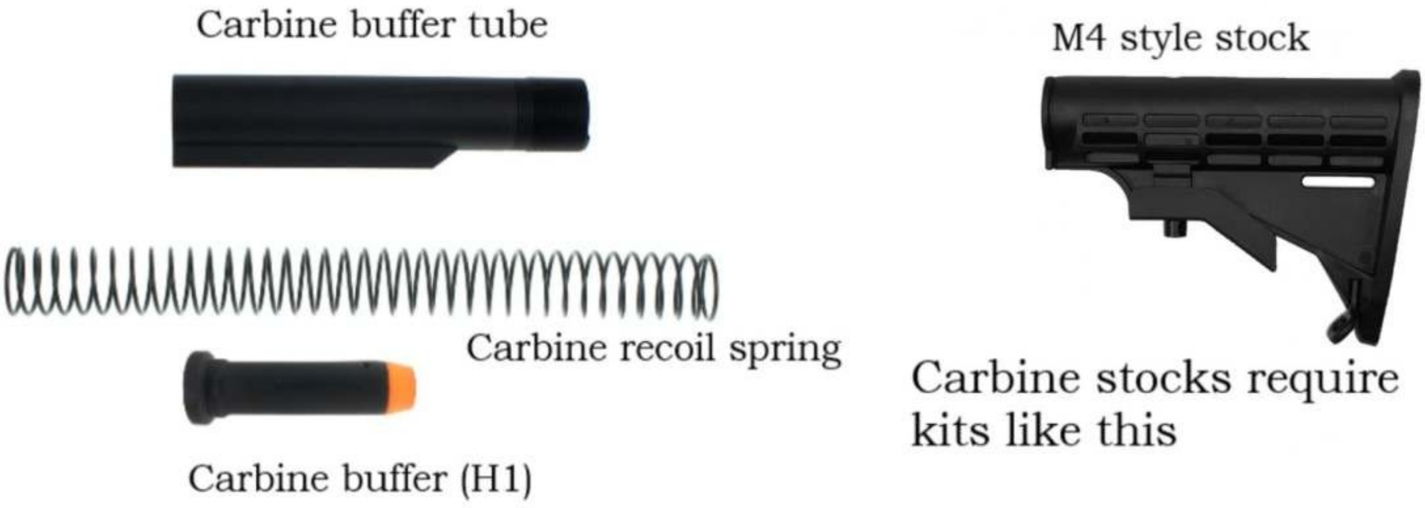
PDW style
(Sized down for space)

Adjustable cheek raiser

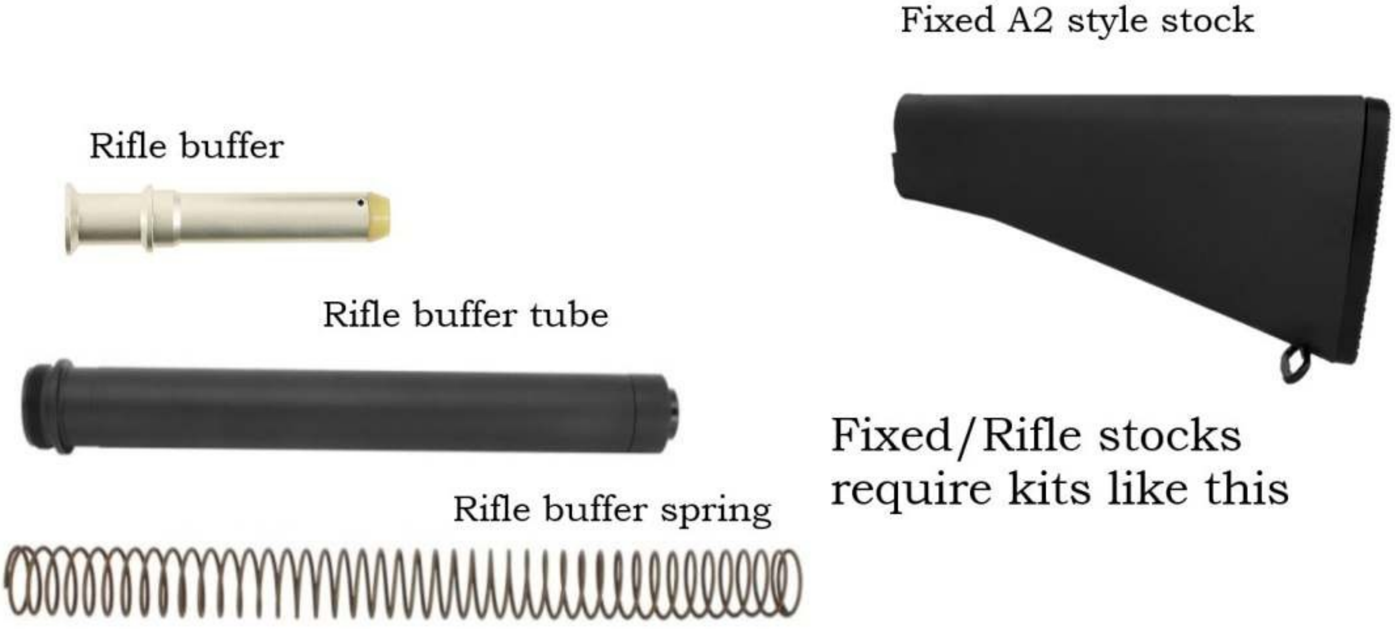
CAR15 style

All of these can range in price from $24-$30 a piece to over a few hundred.
I can’t suggest which is better, I just know the ones I personally prefer.

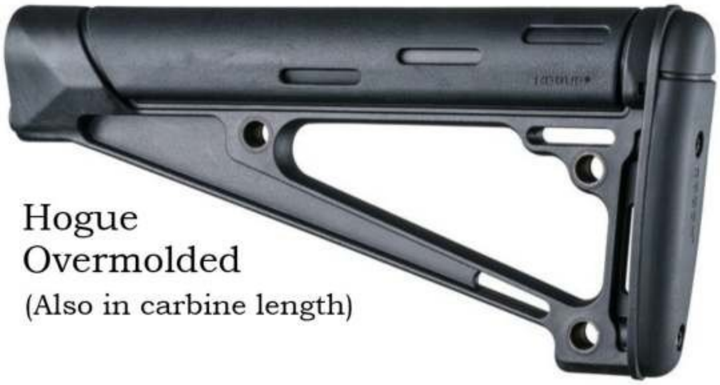
Going back to the buffer and buffer tube (receiver extension), keep in mind that all of these require carbine length buffer tubes, buffer weights, springs, unless otherwise specified with certain variants.



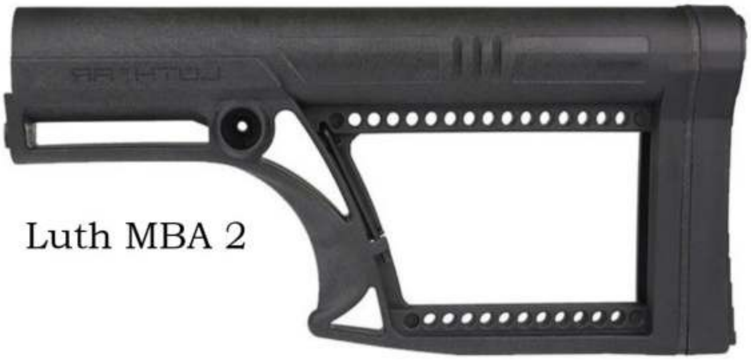
Carbine stocks require kits like this



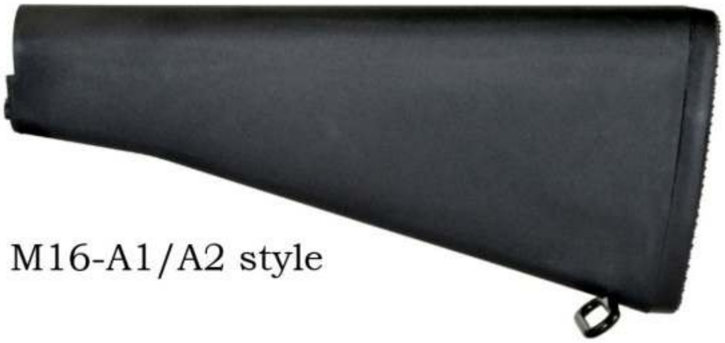
Fixed/Rifle stocks require kits like this



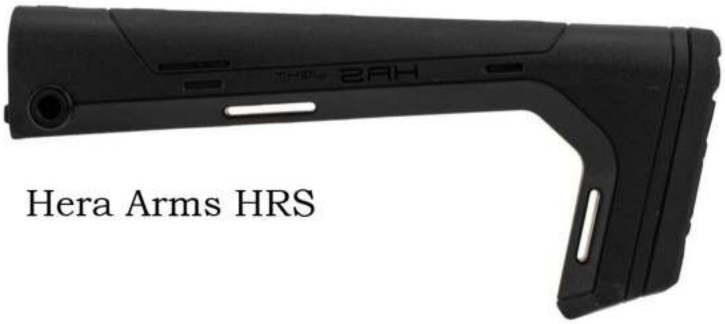
Hogue Overmolded
(Also in carbine length)



Luth MBA 2



M16-A1/A2 style



Hera Arms HRS

There are a few rifle stocks available on the market as well. Plenty more than I could show here anyway.

Unless otherwise specified, they require rifle length tubes, springs and buffers.

I can’t cite much from personal experience, as I have only used carbine stocks as of the time of writing this.

Again, it’s whatever suits your preferences.

Buffer Springs

Just to clarify the visual difference between carbine and rifle springs:

- Rifle buffer springs should be between 11-3/4" to 13-1/2" long
- Carbine buffer springs should be between 10-1/16" to 11-1/4" long

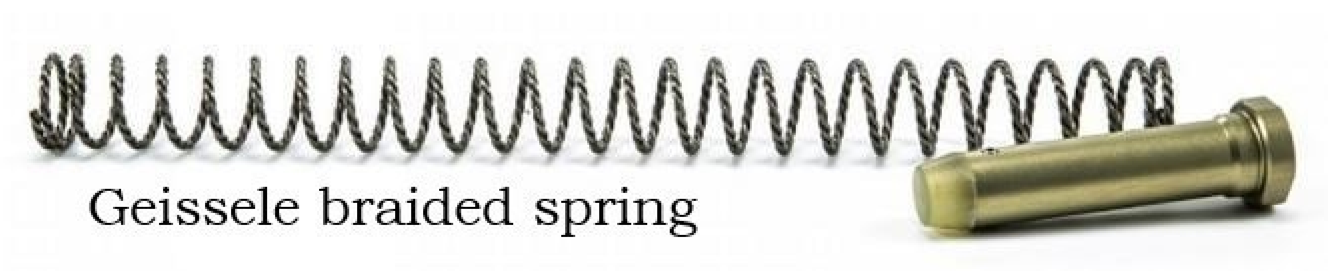
(Only use rifle and carbine components for their fellow parts.)

Springs are also a factor into the whole thing revolving around buffer weight and rifle set up.
I won't got into too much detail since there are companies that produce several options for different springs.

We still have the general carbine and rifle lengths, however certain manufactures make springs that are more and less powerful than others (they decompress more or less).

Sprinco is one company that produces different versions of springs, each with a colored end to indicate if they have more or less power than each other.

Another option available on the market are springs which are designed to reduce the noise via rattling you get in standard buffer springs and weights, either like the Geissele Super 42 spring (triple braided wire make it reduce the springy noise) or the ones I refer to as "hybrids" where the buffer and spring function as one whole component.



JP Enterprises silent buffer spring

These may function better or worse depending on your setup.

Also take note that the Geissele comes with heavier buffers and are said to *not* be used with standard carbine buffer weights.

There are plenty more accessories even I likely don't know of, this was just to serve as an overview of some I thought seemed worth highlighting.

Castle nuts & end plates

The last item needed for the stock and buffer related parts are the castle nut and end plate.

There isn't much to be said about these, but if you are wondering what they're for:

The "latch plate" is commonly referred to as the "end plate".

What the end plate and castle nut do is secure the buffer tube to the lower receiver, on top of it being threaded to the buffer thread at the back of the lower.

There's more to look into with end plates than castle nuts, because castle nuts are essentially just specialized screws to complete the buffer portion of your lower assembly.

(But please do not confuse them with any castellated nuts.)

Castellated nut

Only thing I can suggest is to keep note that these are not the same, but most gun places you would likely be looking at would only sell the bottom one anyway.

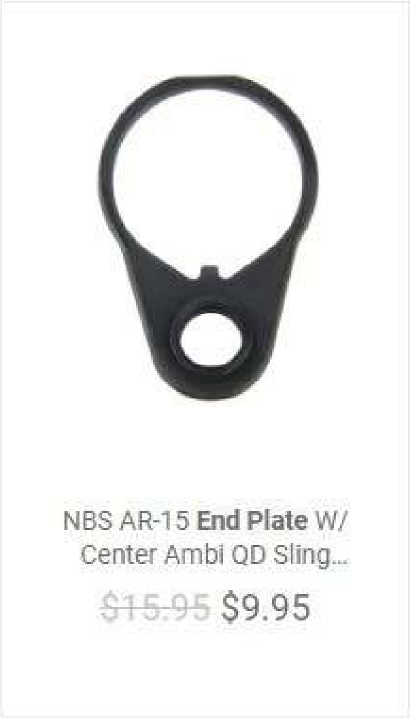
Did I expect people wouldn't be able to tell the difference?
This was just to keep from any confusion if someone happened to be that new to guns.

Castle nut

Now with end plates, we got a bit of variety.

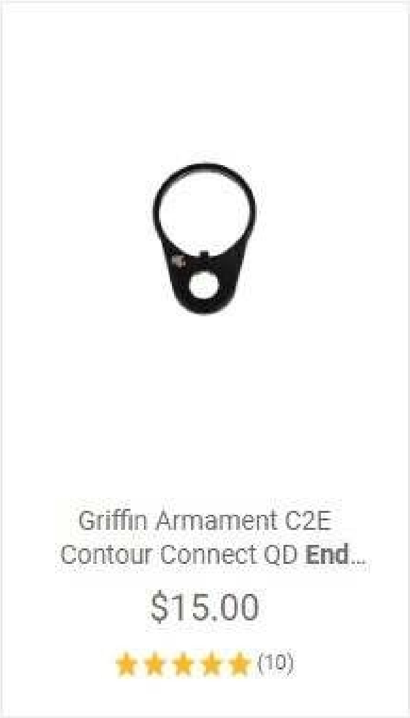
Simplifying them into two types, you can either get a basic end plate or one that has a sling connector of some kind.

Example of basic end plates:



NBS AR-15 **End Plate** W/ Center Ambi QD Sling...

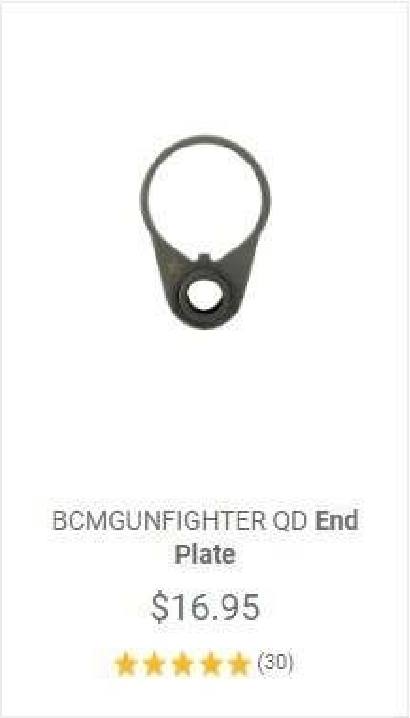
~~$15.95~~ $9.95



Griffin Armament C2E Contour Connect QD **End**...

$15.00

★★★★★ (10)

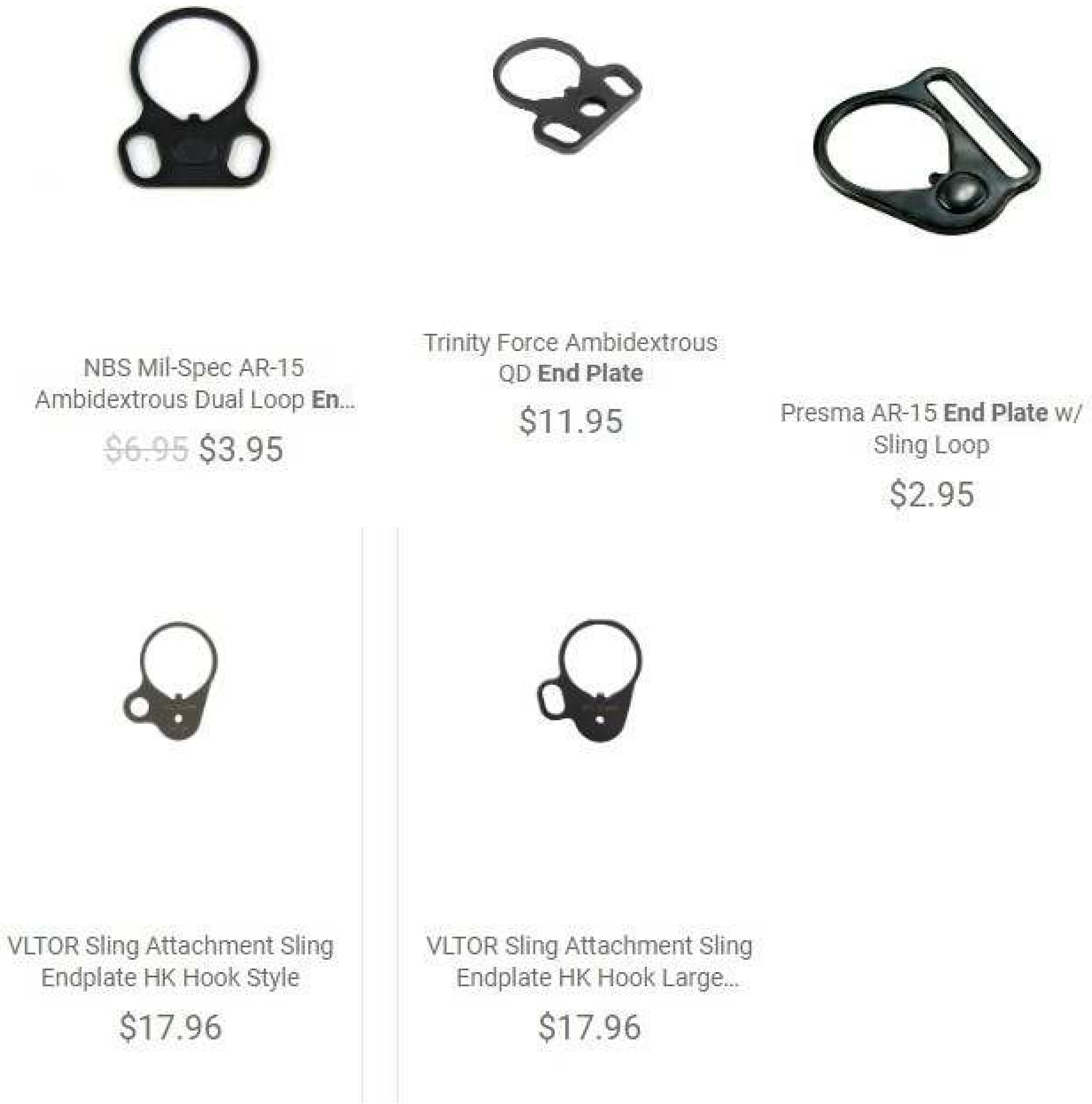


BCMGUNFIGHTER QD **End Plate**

$16.95

★★★★★ (30)

Some examples of end plates compatible with slings.



NBS Mil-Spec AR-15 Ambidextrous Dual Loop **En...**

~~$6.95~~ $3.95

Trinity Force Ambidextrous QD **End Plate**

$11.95

Presma AR-15 **End Plate** w/ Sling Loop

$2.95

VLTOR Sling Attachment Sling Endplate HK Hook Style

$17.96

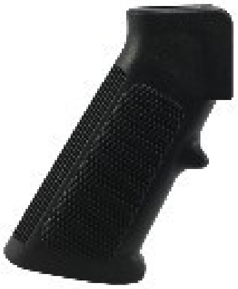
VLTOR Sling Attachment Sling Endplate HK Hook Large...

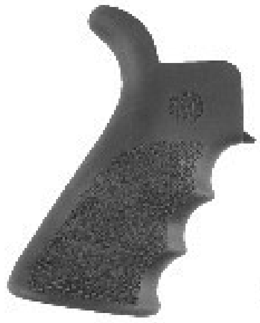
$17.96

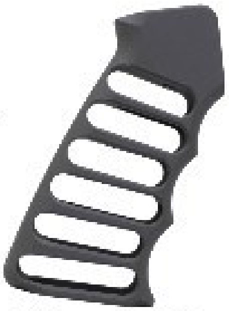
These are for those of you who don't want to keep your sling on your stocks.

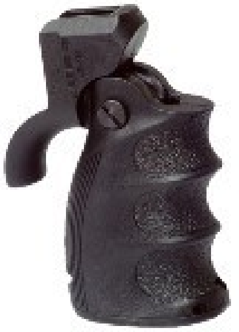
Pistol Grips

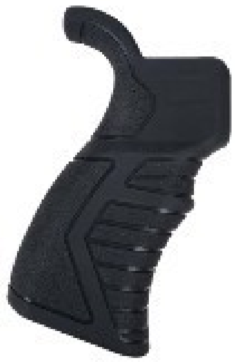
On the matter of pistol grips, there is a very wide selection of options available that can be used for almost any purpose imaginable.

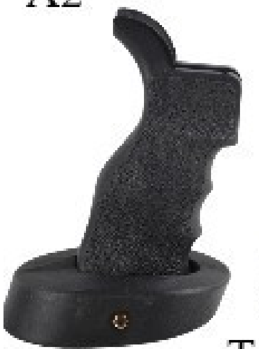

Standard A2

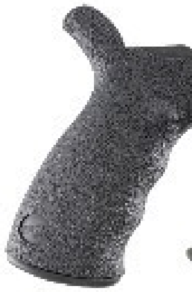

Overmolded

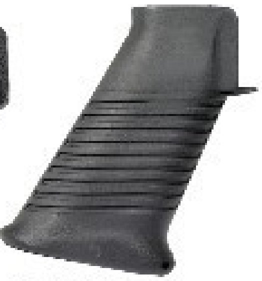

Skeletonized

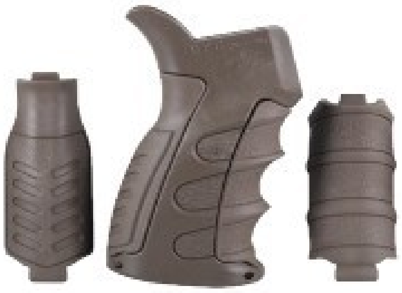

Folding


Rubberized


"Sniper" style


Textured


SAW Style


Interchangable

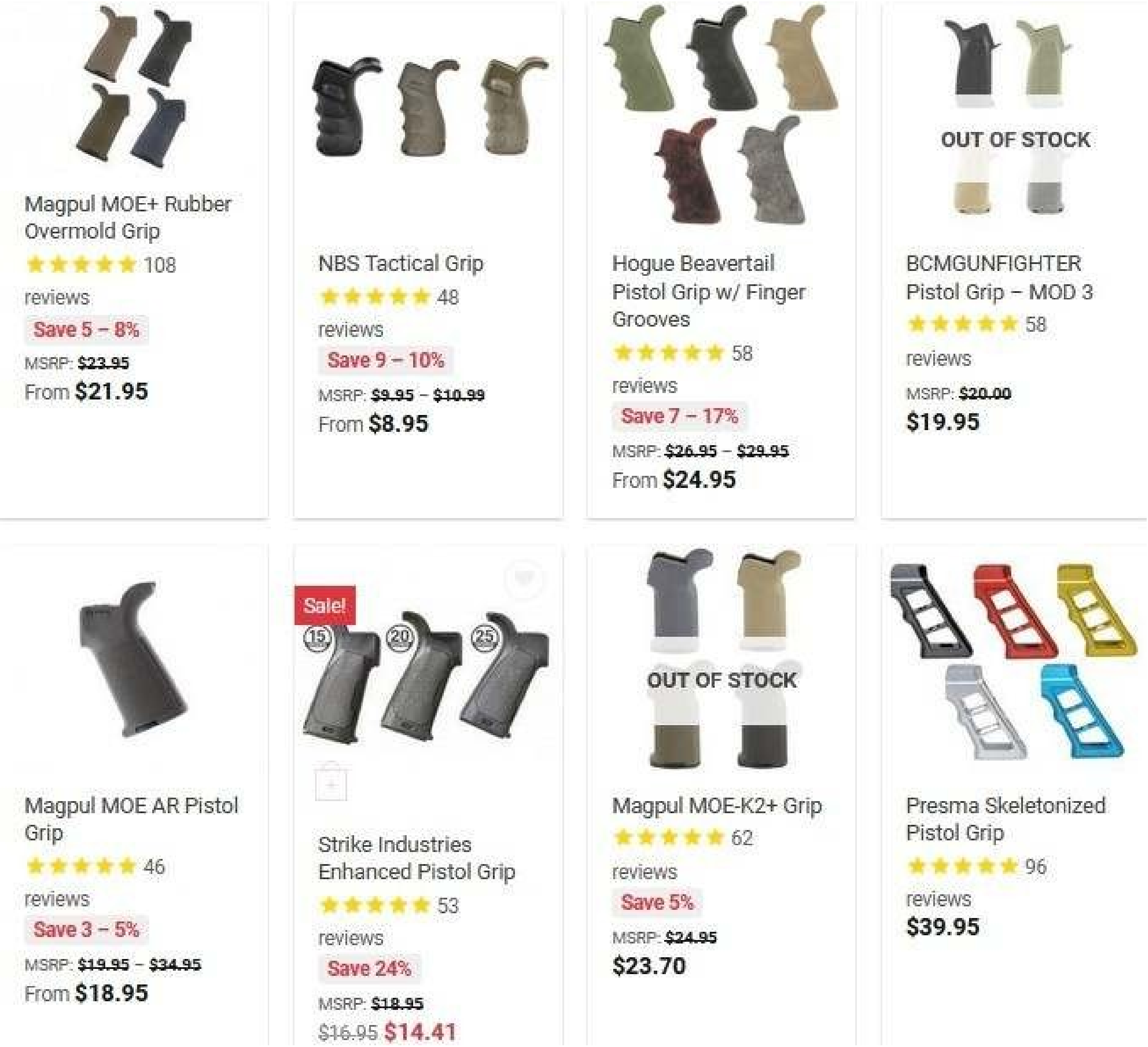
This is by no means the most comprehensive it could be and does not include ‘special’ pistol grips such as California compliant models, because I primarily assume most reading this kind of material are in less bureaucratic jurisdictions.

Once again, whatever suits you best will be up to your own decisions and just what options you can get.

Although one thing to note is keeping mind of the “tails” on the back end of some of these grips tend to have issues fitting on certain lowers.

I have yet to experience a problem with mine and fitting any I have, but still worth mentioning.

Prices vary in a more moderate amount, and varying by distributor and model the most.



Magpul MOE+ Rubber Overmold Grip
★★★★★ 108 reviews
Save 5 – 8%
MSRP: ~~$23.95~~
From **$21.95**

NBS Tactical Grip
★★★★★ 48 reviews
Save 9 – 10%
MSRP: ~~$9.95~~ – ~~$10.99~~
From **$8.95**

Hogue Beavertail Pistol Grip w/ Finger Grooves
★★★★★ 58 reviews
Save 7 – 17%
MSRP: ~~$26.95~~ – ~~$29.95~~
From **$24.95**

BCMGUNFIGHTER Pistol Grip – MOD 3
★★★★★ 58 reviews
MSRP: ~~$20.00~~
$19.95

Magpul MOE AR Pistol Grip
★★★★★ 46 reviews
Save 3 – 5%
MSRP: ~~$19.95~~ – ~~$34.95~~
From **$18.95**

Strike Industries Enhanced Pistol Grip
★★★★★ 53 reviews
Save 24%
MSRP: ~~$18.95~~
~~$16.95~~ **$14.41**

Magpul MOE-K2+ Grip
★★★★★ 62 reviews
Save 5%
MSRP: ~~$24.95~~
$23.70

Presma Skeletonized Pistol Grip
★★★★★ 96 reviews
$39.95

There are pistol grips for essentially every budget and every setup, just remember your washer and screw if you somehow get a grip by itself.

Triggers

By now you should already know that a lot of parts which AR15s consist of have a large variety available for several different kinds of applications.

Single Stage Triggers

This is your standard trigger you likely get in any off the shelf AR and in most lower parts kits, varying by supplier.

Some complain they have a bit of grit to them and aren't the most crisp for using, but do your own research on this if you can.

Single Stage triggers are probably wh most have in mind when it comes t triggers; You pull it and it shoots.

ALG Defense mil-spec trigger

There is no delay between pulling the trigger back and it actually firing. There are other renditions of single stage triggers I will cover in the next few pages.

Two Stage Trigger

I can't recall seeing these come in lower parts kits or gun kits, but then again I don't typically look for two stage triggers.

Geissele Automatics G2S two-stage trigger

This is an example of a two stage trigger, meaning that it has a 'mid-point' when pulled that will put a brief halt on it being pulled all the way back. I hear that this is suggested for people who have more of a marksman set up since it allows them to have an easier time preparing to fire and then less distance to pull back on once they want to fire.

Drop-In Triggers

CMC
single stage
drop-in
trigger

Triggertech
two-stage
drop in trigger

Drop-in triggers don't really have a sole design besides being pre-assembled in metal case bodies, ready to drop right into your lower.
All you need to do is put the trigger and hammer pins in to keep them in place.

Some say it's easier since they don't require the additional assembly like the standard mil-spec triggers do, but it's not that much of a hassle as long as you know which way the springs are supposed to go.

There are variants of trigger designs, typically between the curved, as seen in all the images used, and those which use a straight trigger.

Trigger springs range in differing pull weights, which is the amount of force required to pull the trigger back.
This ranges from 8 pounds to around 3 from what I've seen.

Certainly makes pulling it easier, but I cannot say for sure whether or not it makes the pull more crisp.

Some people also tend to do their own trigger jobs if they don't have money for a drop in trigger, or if they're up for testing their knowledge of firearms by taking it upon themselves to do a task which requires a bit of caution.

I won't cover this subject, but if you feel you're up to the task at any point in time, I've seen people suggest either using a whetstone or a dremel tool for it (flat bit preferred).

https://www.arbuildjunkie.com/how-to-perform-ar-15-trigger-job/

https://acatholicmechanic.blogspot.com/2016/07/improve-your-triggerfor-next-to-nothing.html

(I have no association with either of those links.)

Now we get into the more interesting options for triggers.

Binary Triggers

Franklin Armory
Binary trigger

Binary triggers work in a sort of double shot fashion; One round fired by pulling the trigger, one round fired after releasing the trigger.

The ATF has not quiet got onto these since they don’t qualify as “machineguns since they do not cause two round burst fire like in some firearms, since release of the trigger is required to fire the second round.

There is also a series of other triggers that function the same, such as those by Fostech, but they are referred to as “Pull and release” triggers. I don’t know if that’s because Franklin Armory has some proprietary rights to the name because they came up with the name first, but I digress.

They are completely legal at the moment, but that may change in the future, knowing how the ATF conducts its rulings.

Legal "Full-Auto"

These have come under certain attack by the ATF before, but it's a bit of a gray area.

Forced Reset Triggers

Rare Breed FRT

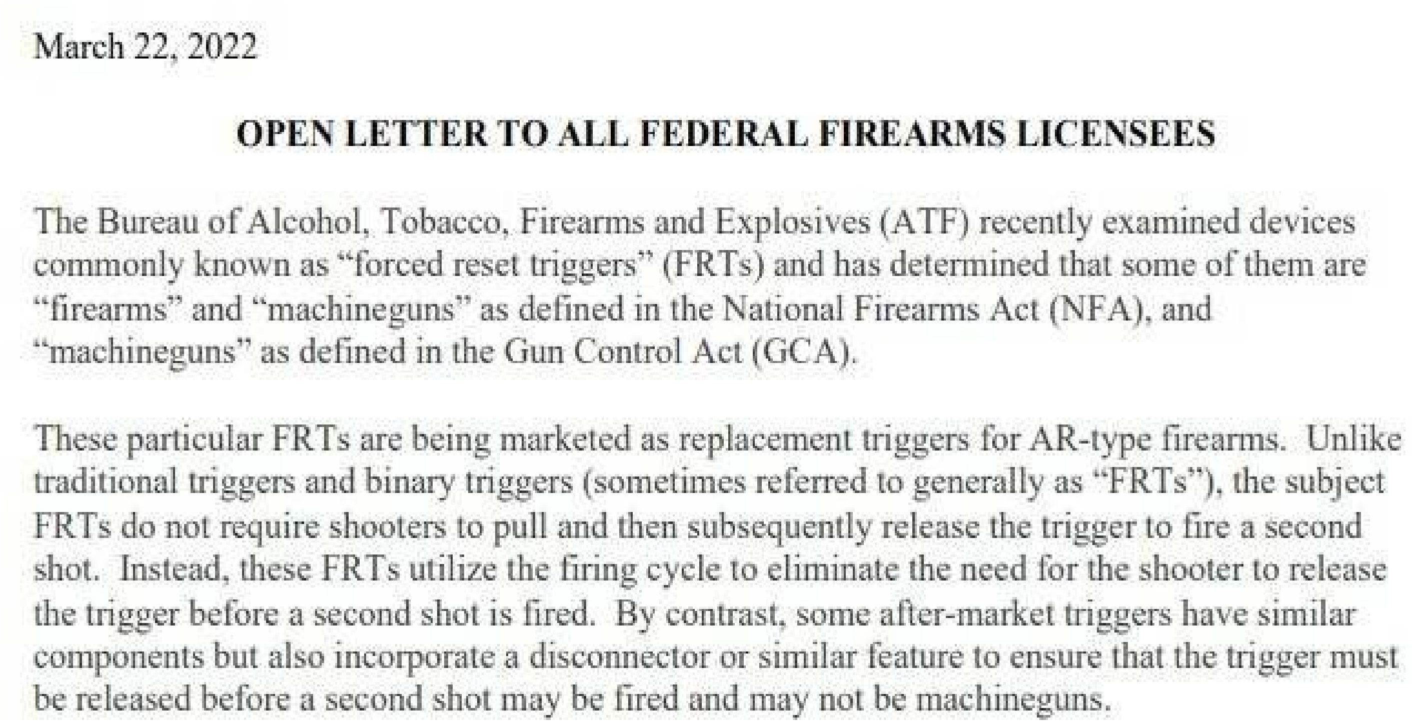
The operation of a forced reset trigger is what the name implies;

The trigger will force itself back into the 'ready' position once it has been pulled, allowing the shooter to firing rounds at a faster rate than if he/she were using a standard single stage trigger.

The way a FRT operates simulates the function of full-auto to an extent, but technically does not classify as full-auto, in certain cases.

First, if you feel familiar with the trigger image above, you may remember that Rare Breed had a run in with the ATF awhile back and as of now, I believe they have since resolved that issue and become a completely legal item, but that may change since the legality of FRTs seems to be a bit gray.

There are plenty of people fear mongering over the ATF classifying these as "machineguns" but that isn't the case.



March 22, 2022

OPEN LETTER TO ALL FEDERAL FIREARMS LICENSEES

The Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) recently examined devices commonly known as "forced reset triggers" (FRTs) and has determined that some of them are "firearms" and "machineguns" as defined in the National Firearms Act (NFA), and "machineguns" as defined in the Gun Control Act (GCA).

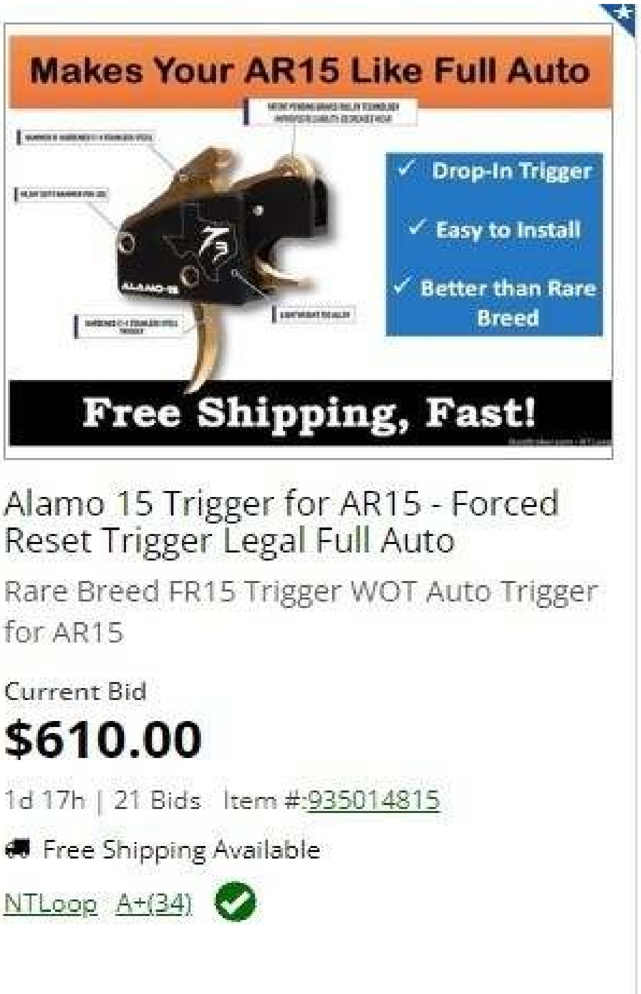
These particular FRTs are being marketed as replacement triggers for AR-type firearms. Unlike traditional triggers and binary triggers (sometimes referred to generally as "FRTs"), the subject FRTs do not require shooters to pull and then subsequently release the trigger to fire a second shot. Instead, these FRTs utilize the firing cycle to eliminate the need for the shooter to release the trigger before a second shot is fired. By contrast, some after-market triggers have similar components but also incorporate a disconnector or similar feature to ensure that the trigger must be released before a second shot may be fired and may not be machineguns.

https://www.atf.gov/firearms/docs/open-letter/all-ffls-mar-2022-open-letter-forced-reset-triggers-frts/download

According to the ATF only some of these may classify as "machineguns" and they do not clarify any brands, but do provide a description of how they must operate in order to be illegal.

I can't assist in naming any brands to avoid, so this is just something to watch out for.
Do I agree with it? Certainly not, but I also don't agree with people who try fear mongering because they're too illiterate to study gun laws, especially when they're the ones complaining about non-compliance.

FRTs can be found from their own manufacturers and private dealers on gun sites all around.



Alamo 15 Trigger for AR15 - Forced Reset Trigger Legal Full Auto

Rare Breed FR15 Trigger WOT Auto Trigger for AR15

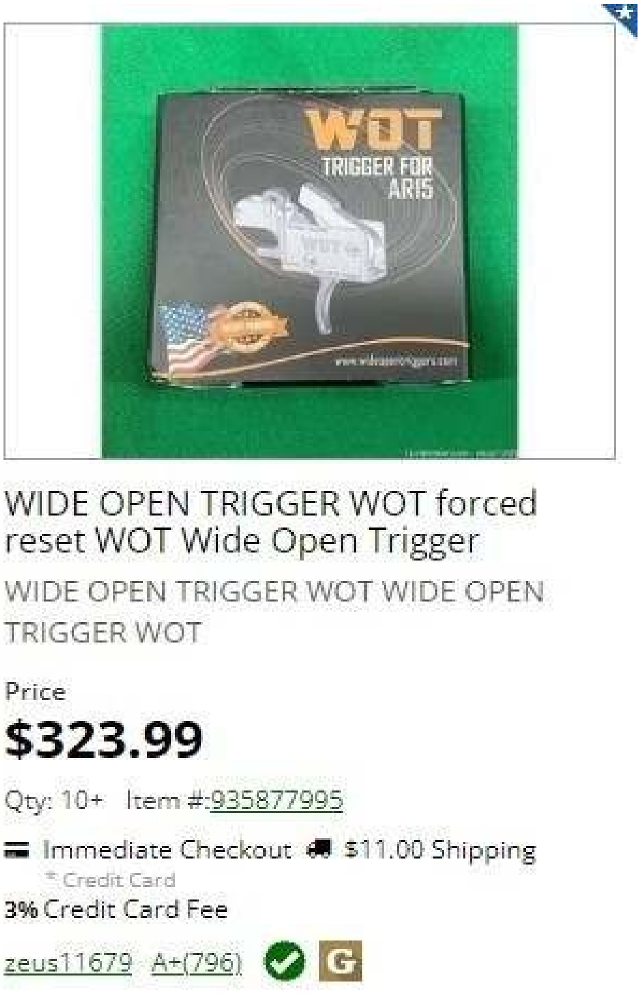
Current Bid

$610.00

1d 17h | 21 Bids Item #:935014815

Free Shipping Available

NTLoop A+(34)



WIDE OPEN TRIGGER WOT forced reset WOT Wide Open Trigger

WIDE OPEN TRIGGER WOT WIDE OPEN TRIGGER WOT

Price

$323.99

Qty: 10+ Item #:935877995

Immediate Checkout $11.00 Shipping

* Credit Card

3% Credit Card Fee

zeus11679 A+(796) G

There are more manufacturers of FRTs than just Rare Breed, however it seems you're more likely to find other options on private seller sites.

Doing my own research I came across Wide Open Trigger's website and thought it seemed a bit sketchy since there wasn't a typical business website layout (add to cart, checkout, etc.) and when trying to check the order option it would just take me to a contact support page for updates if I signed up or if I clicked on the button saying I'm a member, it would just take me to some gun site, not a page which had the trigger with an 'add to cart' button.

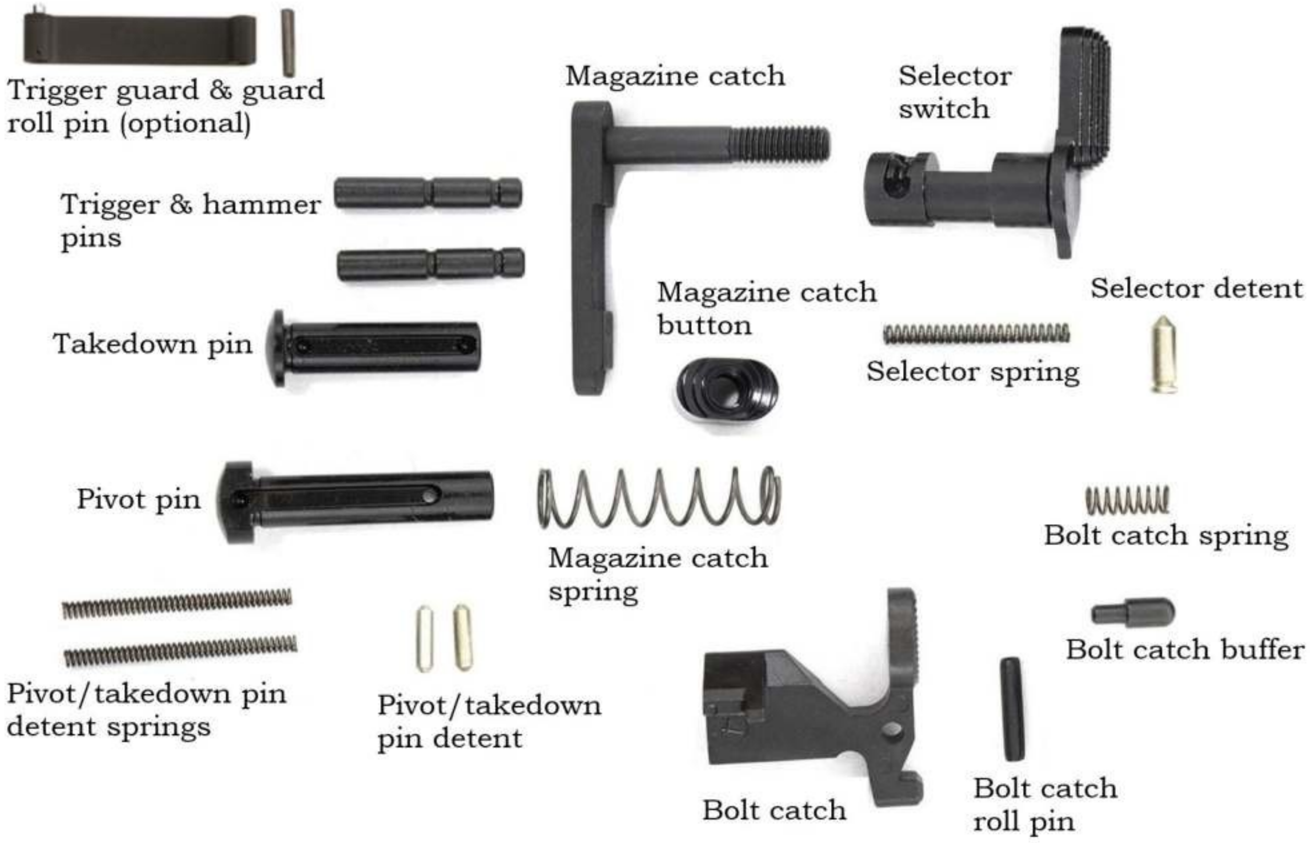
Maybe their triggers are good, but I would just opt to try buying one off of a private seller site personally.

And most of their linked videos on the website were privated, which also makes me suspicious.

For all I know, some of these websites that seem to only specialize in FRTs, aside from Rare Breed, could be possible honeypots.
No favoritism or sponsorship from them, just my honest opinion after checking the websites.

The rest of your LPK

To speed this up, I’ll cover the rest of the parts to complete your lower assembly.

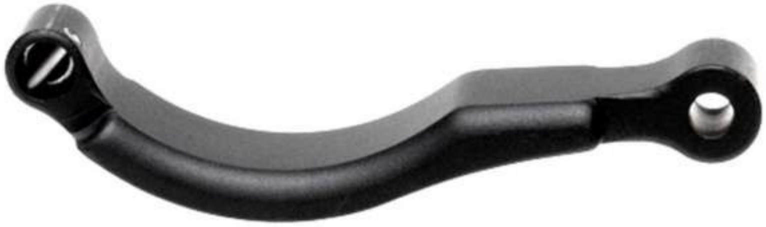


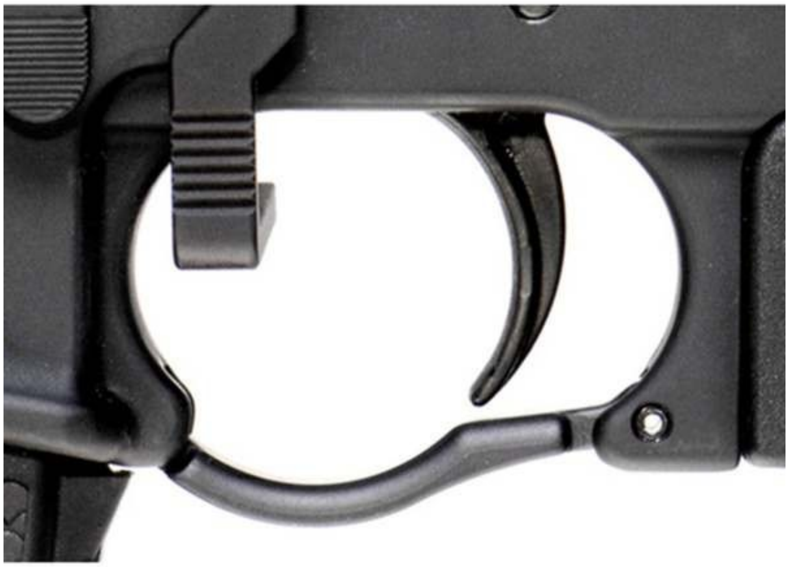
This diagram covers all the additional pieces and their components. Going back to the section on lower receivers, trigger guards and their roll pin are optional for if said lower does not have a guard built in.

Getting the trigger guards out of the way, the only reason you would consider getting a lower receiver which does not have one built is if you plan on wearing gloves, or have concerns over finger space in the standard flat ones.

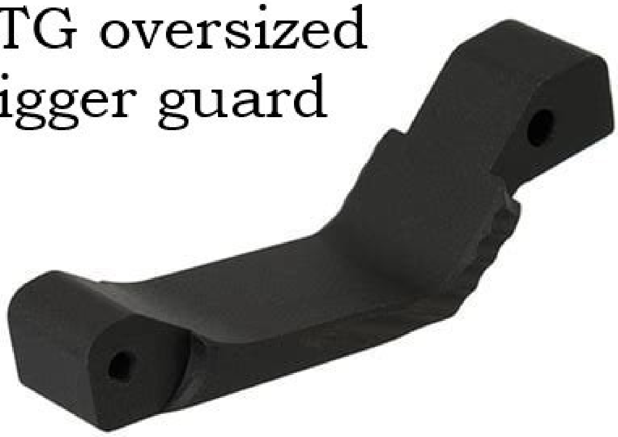
Some companies make “enhanced” ones which have more a downwards curve.

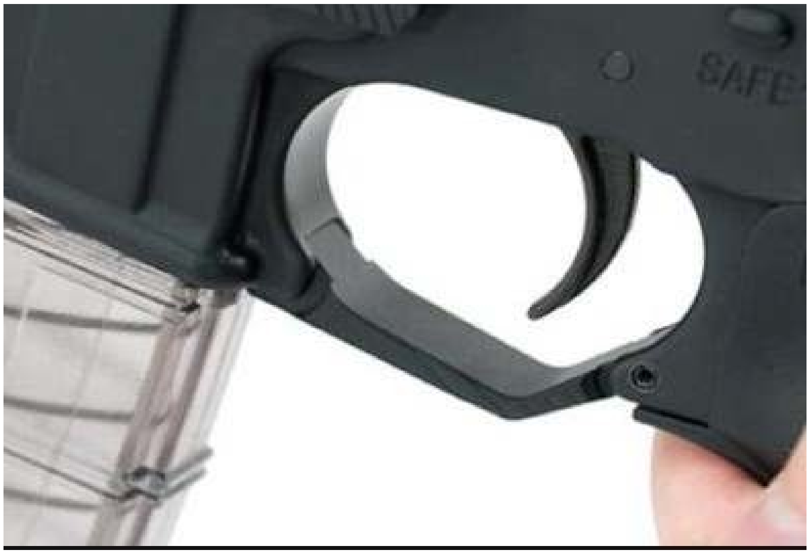
Troy Industries enhanced trigger guard

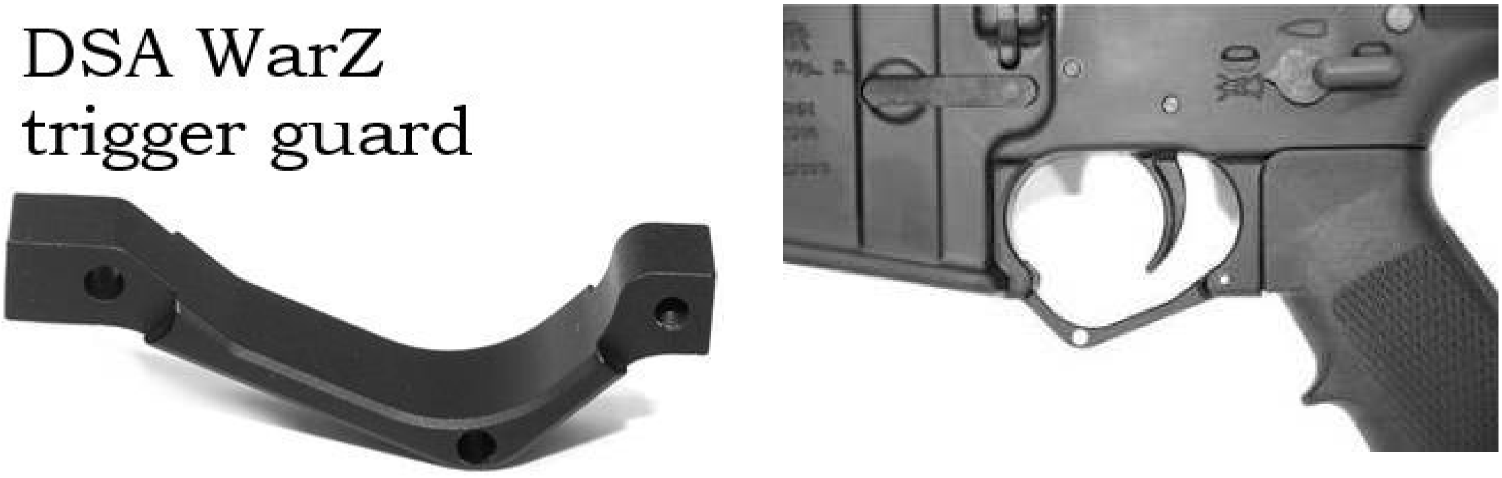




UTG oversized trigger guard







Some examples of different trigger guards.

There are also certain pistol grips that come with built in trigger guards, but I feel no need to cover those.

The bolt catch operates by sitting below the bolt of the rifle, and the followers (the piece in the magazine which feeds rounds upwards) sits too low to engage the bolt catch while there are rounds still in the magazine. When the magazine is empty, the follower will engage the bolt catch, causing it to keep the bolt from cycling into battery again.

The bolt catch also has some options of its own.

While doing some research on different bolt catch designs, I came across this one that I might get later.

RI Tactical
Skull bolt catch kit

I can't think of much of a differe these would provide besides the paddle design they have, although some more like levers.

More examples:

Phase 5 Tactical
EBR V3 extended
bolt release

UTG Oversized
bolt catch

Geissele Maritime
bolt catch

Magpul BAD extended
bolt catch lever

Battle Arms Development
enhanced bolt catch

NBS Mil-spec
bolt catch

Strike Industries
enhanced bolt
catch

Luth AR oversized
bolth catch

The operation of a magazine catch button is to allow the magazine to freely drop from the rifle when the user is attempting to load another magazine.

The magazine catch works by locking the magazine in place once properly inserted into the magwell portion of the lower receiver, and the button is to open the catch, causing it to unlock the magazine in place.

As far as my knowledge goes, magazine catches have a minor variety, but the buttons are another story.

Some magazine catch button (also referred to as magazin release buttons since they drop the magazine currently in your rifle), come with screw holes to attach a larger paddle to provide more surface area to ease process of dropping the mag in order to reload.

KE Arms extended magazine release button

Battle Arms Development enhanced modular mag release

Odin Works Inc. extended mag release

With all of that covered, we can finally move on to the upper half of the rifle.

I don’t really feel a need to cover mag catches since there doesn’t seem to be much worth showing of difference, but then again I’m not showing every option available for anything I cover.

UPPER RECEIVER PARTS

Here are the components of the upper receiver assembly (the top half of the gun).

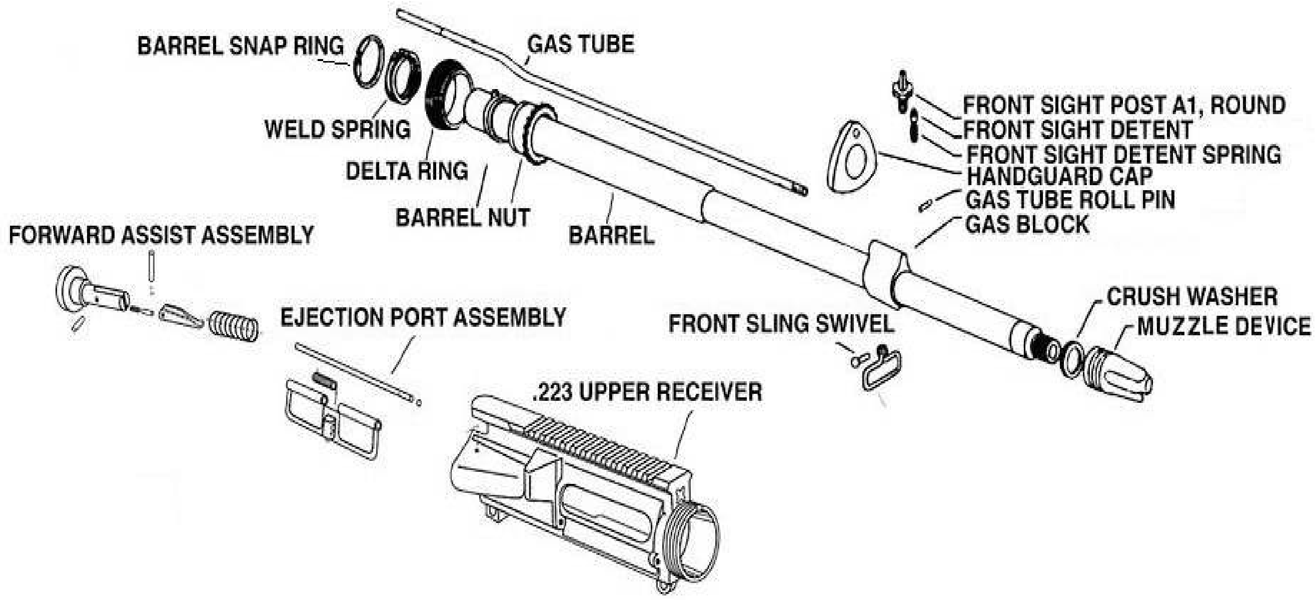
(External components):

- Upper receiver
- Forward assist assembly (optional)
- Ejection port/dust cover
- Barrel & barrel nut (use a manufacture specific barrel nut if using a free float handguard)
- Gas tube & block
- Muzzle device & crush washer
- Handguard (not shown in diagram below)

For drop-in handguards only:

- Weld spring & Barrel snap ring
- Handguard cap & delta ring

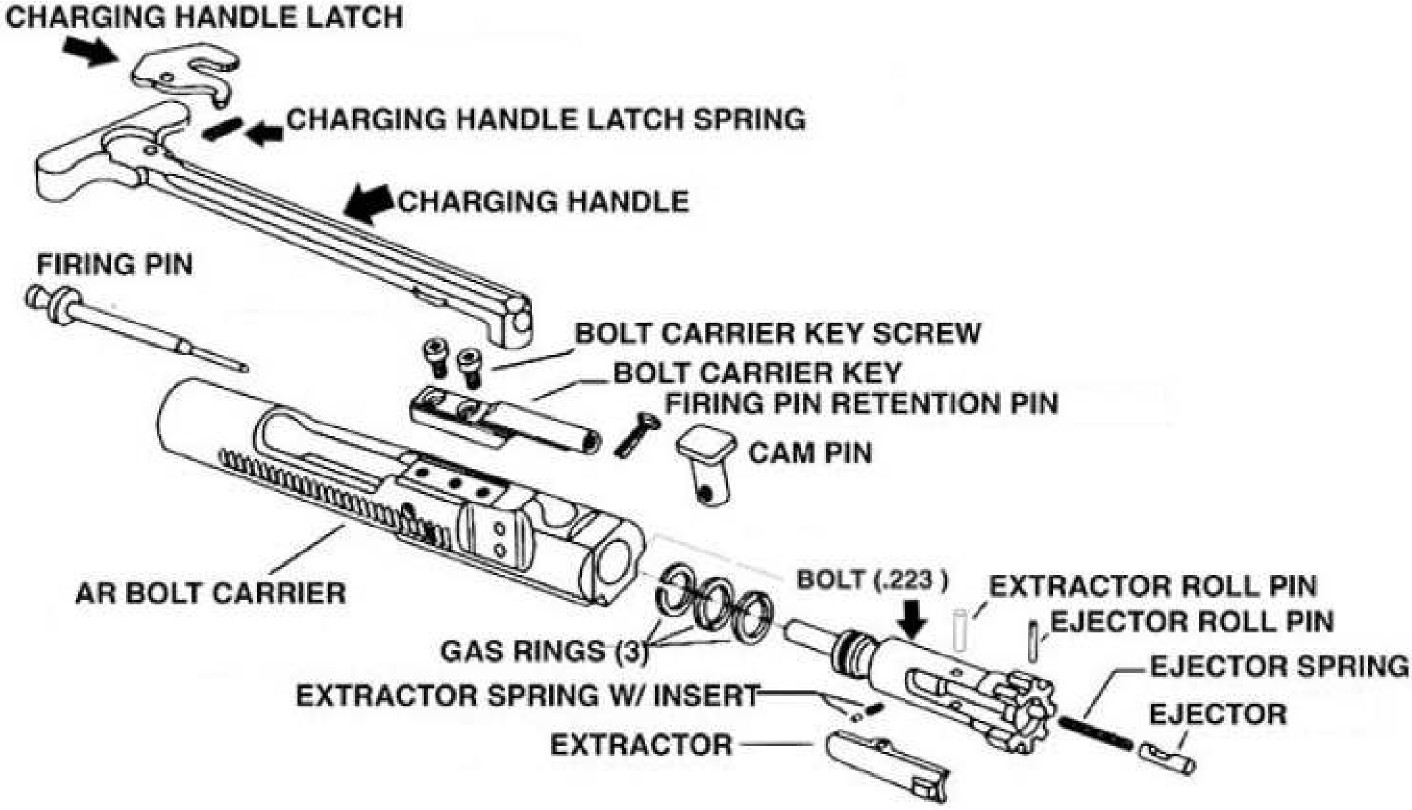
Neither of those last two should be required if you install a free float handguard, which should come with its own barrel nut, otherwise the manufacturer should have some available.



(Error with diagram: gas block shown does not serve as a front sight like A2 front sight blocks.)

(Internal components):

- Charging handle assembly
- Bolt carrier group (bolt carrier, bolt, bolt cam pin, firing pin, etc.)



Upper Receiver: Externals

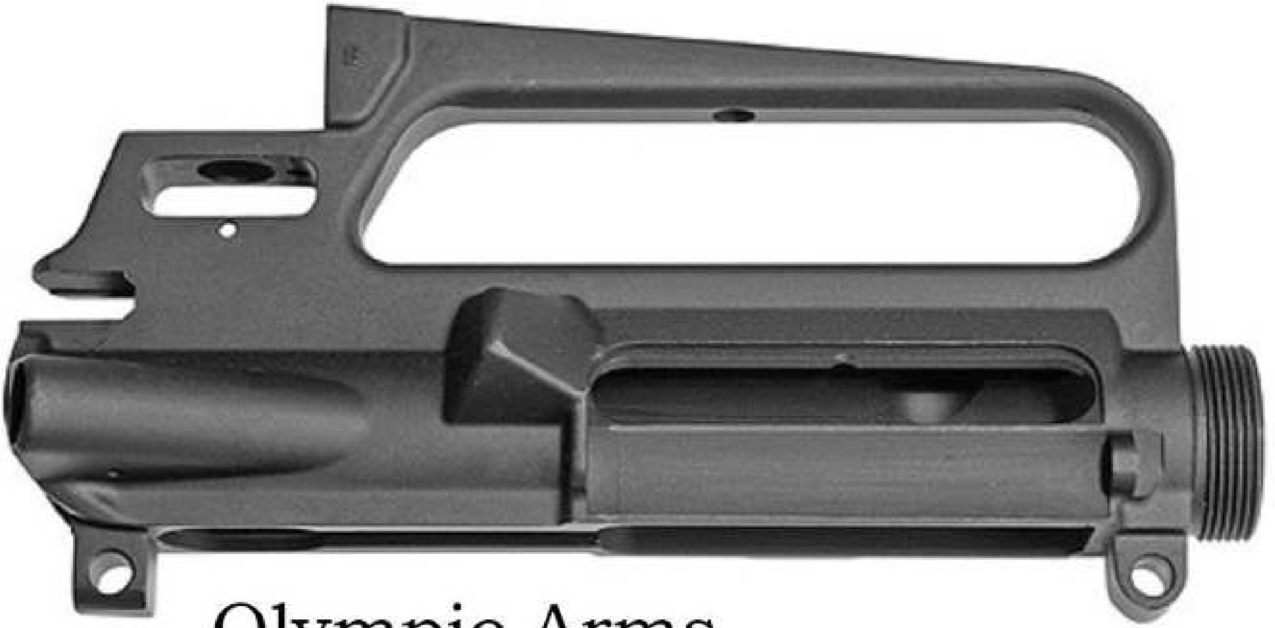
The upper receiver serves the same purpose as the lower receiver, and that is to house all the components which carry the wear and tear when using your rifle.

Davidson Defense
flat top upper

This is a stripped upper you can find about anywhere that sells gun parts, and you can also get complete upper assemblies where all the parts and furniture are included, and sometimes already put together, but I'll still cover every component I can in the case you can't afford that option and also because on top of being a guide on getting an unregistered rifle, to also inform a basic idea of the mechanical function of the gun.

If I'm not mistaken, I believe there are only two types of upper receivers, setting aside open bolt ones since this guide is only covering direct impingement gas systems, not piston operated.

There are flat top upper receivers, such as the one above and then the A1/A2 style which have built in carrying handles.



Olympic Arms
A2 style upper

The flat top allows for more customization with optics, back up flip sights, and even just adding a detachable carrying handle of your own, but if you're going for an A1/A2 clone, you can see which would look more authentic.

Also like the lowers, uppers also come in both forged and billet makes, although I don't think the difference is as significant as it is in lower receivers.

- Take note on feed ramps

  Your upper receiver and barrel will have a certain type of feed ramps to them and if they are mismatched, you may experience snagging on the cartridge as it's being chambered.
  M4 feed ramps are wider, allowing for a more smooth chambering process.

It's easy to find upper receivers that have M4 feed ramps, although barrels may be another story.

The solutions are to either make sure your barrel and upper receiver's feed ramps match or consider getting the dremel tool and cutting the barrel to spec.

(AR uppers have no feed ramps on the inside, M4 ones do.)

According to Gun Digest, you can have an AR upper & M4 barrel, but NOT an M4 upper & AR barrel.

Let this serve as a reminder of the importance of checking specs.

Forward Assist Assembly

Most people not knowing what this does is a bit of a testament to if it’s necessary in most instances or not. Back during the early days of the M16, the U.S. Army had insisted on adding a forward assist to the gun to force it into battery after they started taking the suggestion of the rifle from the Air Force.

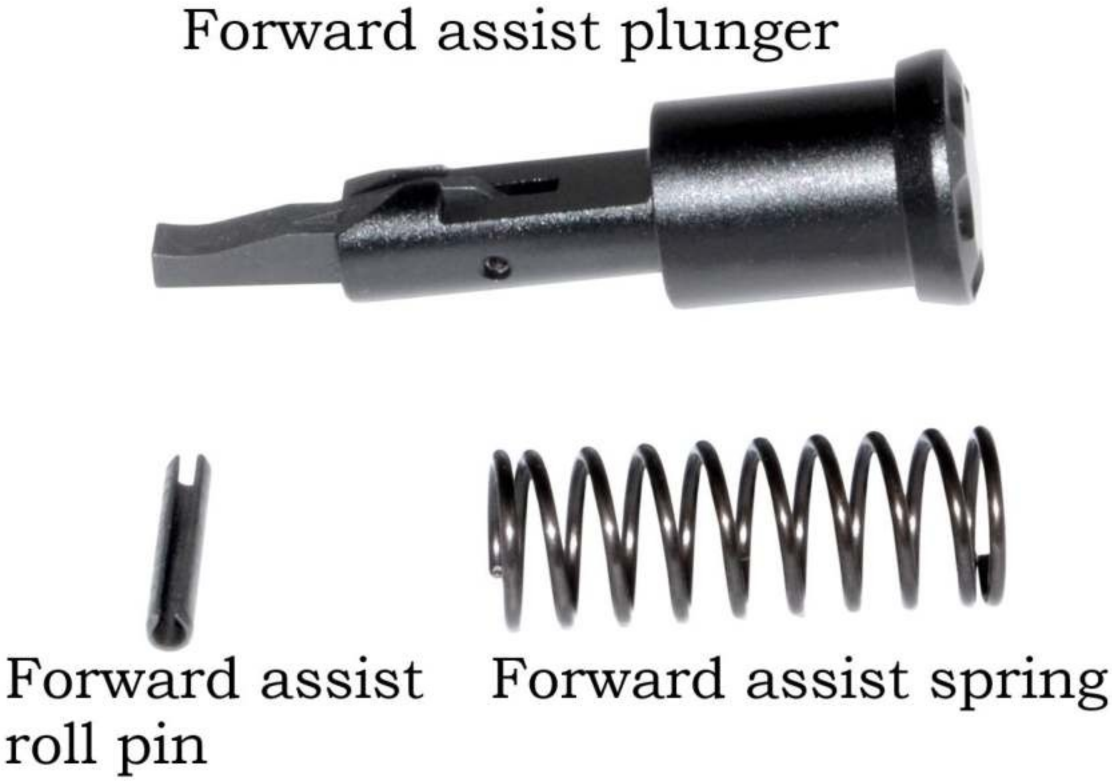
The idea is that if there is some kind of complication of the weapon jamming or failing to chamber a round, the forward assist basically forces the gun to chamber another round, and the idea is that you can deal with maintenance of whatever the origin of the issue was when you aren’t being attacked.

Because of this, there are some uppers that do not include a forward assist section, but given this guide is more for anyone getting into guns for the first time, I didn’t feel the need to cover those.
Do I think a forward assist is required?
Well, I can’t exactly say I’ve needed it, yet.

Although there could be some potential in additional wearing on your rifle by using it, since forcing it into battery could lead to a few issues, depending on just why it jammed in the first place.

It comes down to preference once again.

Not an essential part of an AR15, but an option most people don’t seem to particularly care about whether theirs has one or not.



These are the components of your forward assist assembly.

Similarly to the mag catch buttons, there are different types of plungers, such as this “tear drop” design.

I believe most of these you can order will come per-assembled, but even if not, they aren’t that hard to put together if need-be.

Dust Cover

The dust cover is to cover the open hole at the side of the upper receiver, to, as you may guess, prevent debris from getting inside the internals of the gun.

That cover really helps with keeping dirt from getting into your bolt.

And if you're looking to give some personality to your gun, this is perhaps one of the most versatile parts you can get in terms of custom engraving.

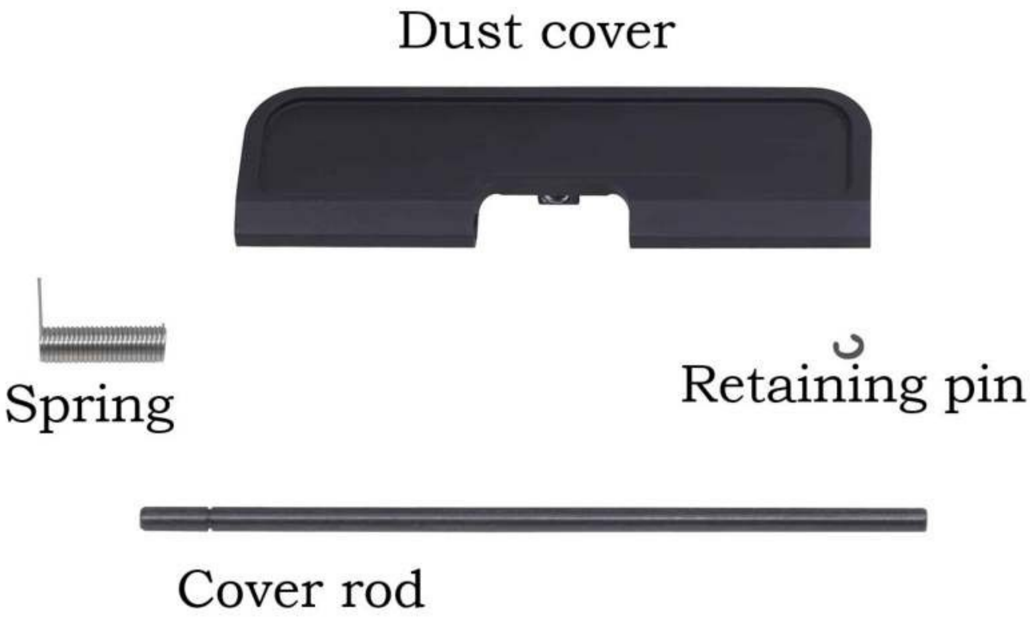
ARRGH
USA
PROP 65
WARNING
THIS PRODUCT CONTAINS LEAD, A CHEMICAL KNOWN TO CAUSE CANCER, BIRTH DEFECTS, AND DEATH
ZOMBIE
HUNTER
PUNISHER
5.56

Some like that tan one aren't capable of being engraved on account of being polymer, whereas about any aluminum one should be fine to engrave, but you should leave that claim to the experts. You can either find a dust cover with an engraving or design which you like, or you can find certain services that offer custom engraving. I haven't used any, so I can't give my own behalf on experience.

But you can get pretty creative with some of the ideas, as long as you can get the design to fit.

Just pay mind to what's gonna show on the outside (when it's closed) and what's gonna show on the inside (when it's open).

Your dust cover assembly is going to consists of these parts and if they do not come per-assembled, it is a simple process like that of the forward assist mentioned earlier.



(Some refer to the pin as a "snap ring" as well.
(Just take note that the short end of the spring goes on the inside and the long end rests on the dust cover.)

Barrels

First off, covering profiles of AR barrels since the profile is likely to be the first thing you notice when looking for options to try out, and these aren't just cosmetic, they have an actual affect on just how well your rifle will be suited for certain uses.

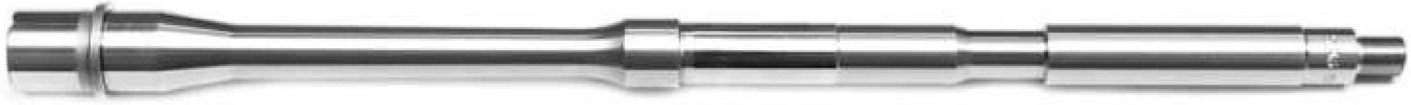
I can't say there will be a universal option due to the large variety of calibers you can get AR15 builds in, so this will just be an overview of options that I can find commonly available for .223/5.56 set ups. You may have more or less difficulty when searching for certain barrel profiles in other calibers.

Profiles

Ballistic Advantage 16" pencil barrel

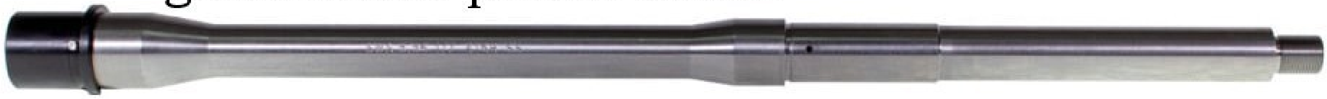
Pencil/lightweight barrels are probably the lightest standard option I've seen.
Often suggested for those who often hike with their rifle, want a lighterweight set up and so on.
But with this thin profiling, there's a disadvantage when it comes to things like continuous fire and mag dumping.

If you plan on expending a lot of ammo, maybe look for something on the thicker side.

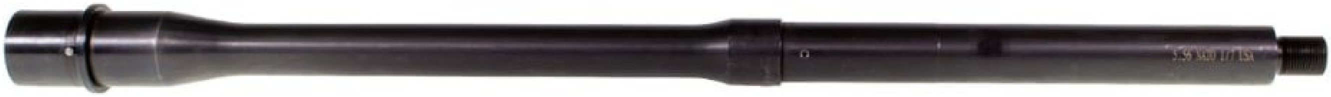

Ghost Rifles 16" M4 barrel

If you notice the visual differences, the M4 profile has a thicker cut at the back of the barrel where the round is chambered, thins out, then has thicker points at the gas port and near the muzzle.
There’s also this notch near the front some tend to have, which is to accommodate an M203 grenade launcher to my knowledge. Not so much a pro/con as just a trivial bit. (Not all have that notch.)

The additional thickness in the more pressure bearing sections make it better for mag dump related uses and the additional weight towards the front helps reduce muzzle rise and stabilize the rifle.


ELD Performance 'Defender' 16" government profile barrel

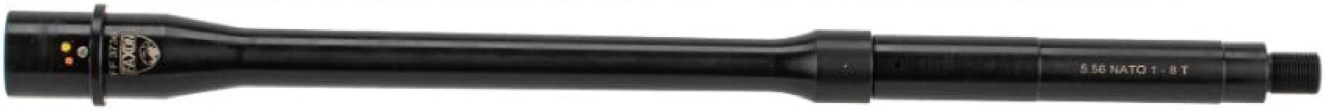
Similar to that of the M4 profile, minus the M203 notch, with more weight towards the back of the barrel and near the muzzle.


ELD Performance 'Kazam' 16" medium barrel

There are apparently also some companies that produce “medium” profile barrels, which to me just looks like a thickness between the pencil and government profiles.

Perhaps a bit of a compromising option for someone who wants more durability and accuracy than a lightweight barrel, but not the full weight of a government or M4 profile.

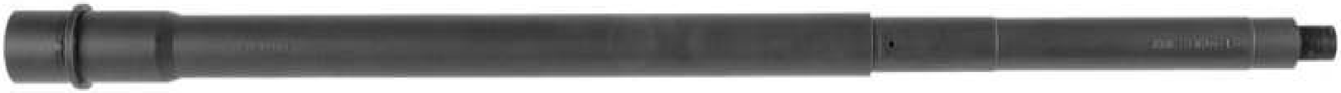
Faxon Firearms 14.5" SOCOM barrel



SOCOM barrels are an interesting thing.
It's like they're designed in the opposite way you would think of an M4 profile. It's thicker at the base to the gas block, then thins out towards the muzzle.

Seems comparable to that of a medium barrel.

Criterion Barrels Inc. 20" Hbar barrel

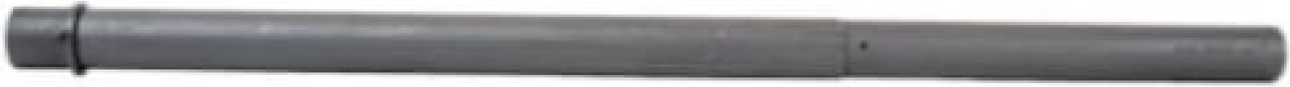


On the heavier side of things, we have the Hbar profile.

It starts thicker and thins out a bit as it goes towards the muzzle, and the idea behind this is that it's supposed to add more heat resistance to the barrel, as overheating will eventually become your accuracy's worst enemy.

More weight, but at the same time more durability and capability for sustained fire.

BC-15 20" bull barrel



There's also this series of barrels referred to as "bull" barrels. Pretty much a consistent thickness throughout the entire length, which I feel similar to the Hbar, is for heat resistance.

My biggest con in mind with these is that none seem to be threaded, meaning they can't accept muzzle devices.

There are also options of 'fluted' barrels which have these lines cut out of them to reduce weight and some would argue it also assists in the barrel cooling down faster, although these primarily seem to be options on heavier profile options.

Twist Rates

The second thing you're likely to notice when looking through barrel options is that they will have this in their description or the item name "1 in (number usually between 7-9) twist", and what that's referring to is the spin it puts on your bullet as it leaves the barrel. Rifling is the internal grooves on the inside of the barrel to put spin on the projectile to improve overall accuracy, although there's a bit of a sweetspot for the ammunition being used.

The 1 means the revolution of a spin and the second number means the amount of inches the revolution was achieved in.

So 1 in 7 twist means one spin in 7 inches, 1 in 8 means one in 8 inches and so on.

If there is too little spin, the bullet will fail to stabilize and cause a tumbling effect, which may cause the projectile to hit a target sideways rather than straight.

Too much spinning and you get an effect in which the bullet will violently spin through the air and possible destroying itself in the process, causing debris of hot lead bits to fly who knows where.

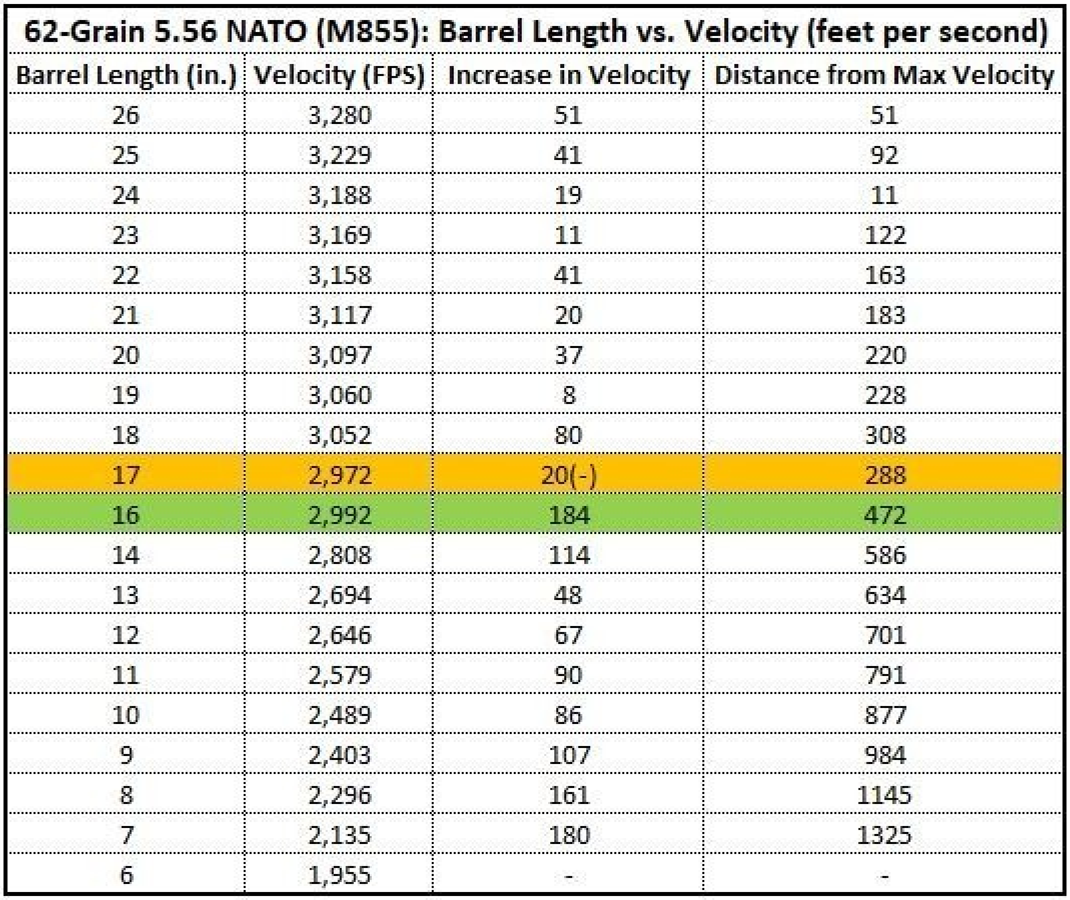
The exact sweetspot only lies partially on the weight of your cartridge being used, and more on the length of the bullet.

The general idea is that if you're shooting 5.56/.223, a 1 in 7 or 8 twist should be fine. The military opted for 62-77 grain 5.56 with a 1 in 7 twist rate.

Then for calibers like 300 blackout, it seems to be suggested to go for a 1 in 8 twist, but if you would prefer using 300 blackout rounds that aren't subsonic, maybe opt for a 1 in 10 or 12 if you can.

Length

Now the selection of barrel length isn't as much a case for accuracy as it is for the velocity of your cartridge.



62-Grain 5.56 NATO (M855): Barrel Length vs. Velocity (feet per second)

Barrel Length (in.)	Velocity (FPS)	Increase in Velocity	Distance from Max Velocity
26	3,280	51	51
25	3,229	41	92
24	3,188	19	11
23	3,169	11	122
22	3,158	41	163
21	3,117	20	183
20	3,097	37	220
19	3,060	8	228
18	3,052	80	308
17	2,972	20(-)	288
16	2,992	184	472
14	2,808	114	586
13	2,694	48	634
12	2,646	67	701
11	2,579	90	791
10	2,489	86	877
9	2,403	107	984
8	2,296	161	1145
7	2,135	180	1325
6	1,955	-	-

Longer length does equal more velocity, but there is a point in which the additional velocity has a minimal increase.

Chart from https://www.ar-15lowerreceivers.com/80-lower-news/the-complete-guide-to-ar15-barrels/

From the data shown, they compare different barrel lengths to provide the case that more length will tend to become useless after a certain point.

“Our increase in velocity jumps by 184 FPS, and when we go up one more inch (to 17"), we actually *lose* velocity! As we continue adding length to our barrel (from 17" up to 26"), we start to see more of those diminishing returns. Eventually, we gain just 11 and 19 FPS per extra inch of barrel. Small potatoes.”

They suggest going with a 16” barrel, which is to be expected since most AR platform rifles do come with that standard, aside from M4 or M16 clones.

Rifling Process

There are a few ways barrels are rifled and here’s an overview:

Cold hammer forged barrels are very hard and rugged, giving potential for a long life span even under constant use.

Cut rifled barrels are the most accurate of the options, often producing match-grade barrels with sub-MOA accuracy.

Button rifled barrels are produced in a similar way to cold hammer forged options, but in a more rough finishing process.

Again, it comes down to preference for this one.

Barrel Steel

4140 Chromoly is probably the most common barrel steel you'll find on the market and given that, it is often very budget friendly and without much concern for inaccuracy.

4150 Chromoly is the upgraded version of 4140, adding longer barrel life and slightly more accuracy in comparison.

Chromoly Vanadium are more tough and hard due to a reduction in material structure by the addition of a minor amount of vanadium to its alloy.

Cited for being the material used in Colt issued barrels for military issued rifles.

416R Stainless are said to be the most accurate, as they are the most heat resistant, however I believe that is only to a certain threshold when studying barrels on my own time and hearing about how after a certain amount of use would cause enough heat to override the resistance of the material, but that should be expected with all barrels realistically.

Often more on the expensive side of things.

Didn't cover the whole chemical foundation of these since I didn't feel the need to lecture my readers on it.

Barrel Finish

Melonite/Nitride provides a durable barrel which is rust and abrasion resistant. This finish can be applied to chrome-moly and stainless steels for greater wear resistance.

Parkerized (aka manganese phosphate) is a cheaper alternative to the other options, but with that given, it is known for having a bit of a lower lifespan with use.

A drawback is that it requires oil for use in more humid environments. And it's also not compatible with non-ferrous metals, so don't expect to see it on 416R barrels.

Chrome Lining has a nice combination of natural lubricity, corrosion resistance and hardness.

Chrome lined barrels are said to have better capabilities for expending rounds and increase of lifespan compared to stainless steel barrels.

Due to the lubricity and hardness, heat dissipates more.

The largest drawback I can see is that since chrome lining is a finish that goes on the inside, it adds material to an already rifled barrel, thus has a potential to reduce accuracy to an extent.

Since I'm not a barrel expert, I would suggest researching more about these, but I got my picks.

Final Notes

- NEVER fire 5.56 in a .223 barrel

  The pressure required for a 5.56 is higher than that of a .223 round and the neck on a 5.56 is wider, so the rule of thumb is you can fire a .223 from a barrel chambered in 5.56, but NOT the other way around.

- NEVER rely on your lower receiver for what your *barrel* is chambered in

  People often rely on their lower receiver (assuming it has the caliber engraved on it), but that means nothing since the lower just houses parts, the barrel is what actually chambers the round. Look for a barrel that has the caliber it's chambered in on its side and if you can't get one, get one and have it engraved or keep a note somewhere to avoid mistakes that may end up costing you your rifle.

- Consideration

  If you run 5.56 and .223, you should consider getting a .233 Wylde barrel. .223 Wylde is *Not* a caliber, but a hybrid barrel design between 5.56 and .223 Rem, making a barrel which is often said to provide more accuracy for these rounds. You can just run both with a 5.56 chambered barrel, but I believe 5.56 is more optimal in that, whereas I usually hear .223 Wylde is the best of both worlds.

Gas Tubes & Blocks

Back to the whole point on buffer weight and spring choice, we're back at the gas operation on the upper receiver.

- (Shortest) Pistol length is 6.75"
- Carbine length is 9.75"
- Mid-length is 11.75"
- (Longest) Rifle length is 15.125"

(Recite page 32 for the rule of thumb on tube length and buffer weight.)

Cite the tube requirement when buying your barrel or measure from the chamber to the gas port if you just can't seem to find the specs from the dealer you got it from or if it's not marked on the barrel itself.

The gas tube goes the length of the chamber up to the gas port, where the gas block sits.

Often the shorter barrels will take pistol length and longer will take rifle length, with some intermediate ones varying by barrel design.

Some also cite cheap barrels having larger gas ports (the hole which the block sits on) for making it easier to fire cheaper ammunition, however, for more specific set ups, those cheap barrels tend to be a bit of a hassle with the effect they can have on your cyclical operation.

Gas tubes come in a few sizes as already mentioned, so make sure you read what gas tube length your barrel has prior to buying anything and attempting to put it together.

Tubes usually are one of the lower price pieces of this puzzle with minimal variety, at most just having different coatings.

Although I don't feel much need to go over that.

Getting into blocks, we get a few different options:

CMMG low profile gas block

JP Enterprises Adjustable gas block

(Not all have rails)

Daniel Defense Fixed A2 front sight

Low profile gas blocks are often popular for allowing more customization with front sights, either by allowing more length of a handguard or by adding more railing of its own.

Front sight blocks, such as the A2 front sight above, serve as both a sight and a gas block.
Not all come with bayonet lugs, so keep mind of that if you plan on running one.

There are two common sizes for the dimensions of gas blocks, and those are 0.625" for thinner profile barrels and 0.750" for more moderately sized ones.

But if you opt for a bull barrel, there are 0.875" and 0.936" inner diameter gas blocks as well.

Adjustable gas blocks are for those who want to try being precise with just how much gas pressure is being uses in their rifle's cyclical operation.

Some are attached with set screws, others require 'fixing' to the barrel by being pinned into dimples in the barrel.

The pinning process is one you can do at home if you have the equipment to properly install it without ruining the alignment.

https://youtu.be/NbIXoQ92lgY
This is more a suggestion for putting an A2 sight block on your barrel than pinning it. Still pretty useful.

https://www.itstactical.com/warcom/firearms/diy-ar-15-build-front-sight-base-installation/

https://acatholicmechanic.blogspot.com/2016/02/diy-a2-front-sight-base-install.html

https://acatholicmechanic.blogspot.com/2016/11/diy-a2-fsb-install-version-20.html

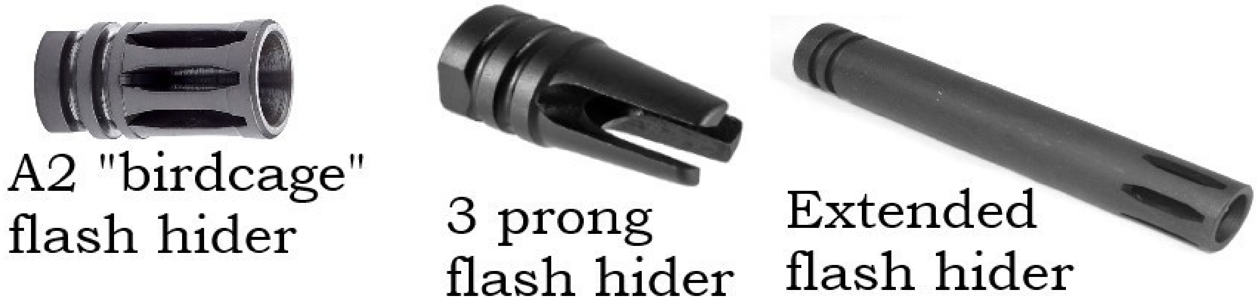
(Again, no association on my part with these links.)

Muzzle Devices

If you notice the threading at the end of most barrels (the muzzle), you may wonder just what the purpose of that is.

The purpose is to add a muzzle device, which have 3 primary categories and 1 extra that's more of a hybrid.

Flash Hiders/Flash Suppressors



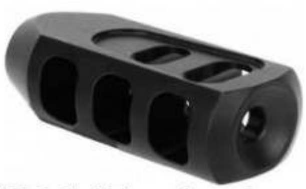
When firing a gun, the gases in the barrel disperse and once they meet the cooler air in the immediate environment, they cause a light effect which is where your muzzle flash comes from.
Flash hiders, also referred to as flash suppressors, work to disperse this gas to reduce the visible flash effect.

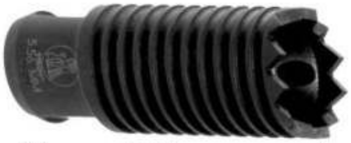
Some may argue they aren't the most useful in day-time operations since a muzzle flash at night is a dead position giveaway.

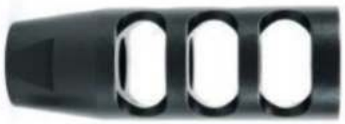
They also aren't known for providing recoil reduction.

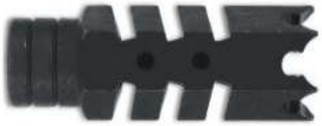
The birdcage design is usually the most common on off the shelf ARs and often the cheapest option. There are plenty more than just the examples shown that I didn't include out of the possibility of me not being able to identify a proper flash hider since I don't really look for them.

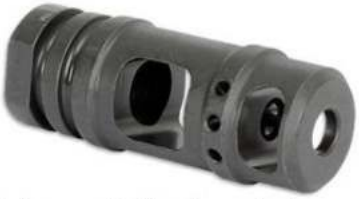
Muzzle Brakes

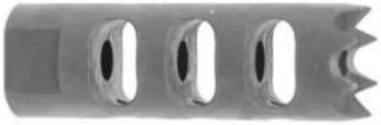

NBS 'Tanker' muzzle brake


Troy 'Claymore' muzzle brake


NBS 3 port muzzle brake


'Shark' muzzle brake


Midwest Industries 2 chamber muzzle brake

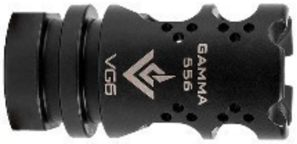

PSA "Z-brake" muzzle brake

The dispersion method muzzle brakes use reduce the effect of felt recoil and assist in handling of the weapon.
However, by the way the gas disperses they are known to be loud due to concussive effects from the gases.

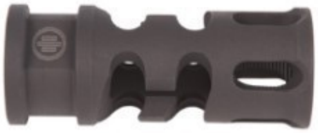
Of course with anything gun related, loud noises should be expected regardless.

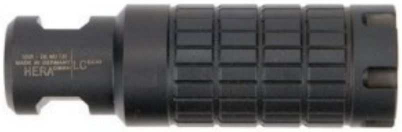
It also provides no muzzle flash mitigation.

Compensators



Aero Precision VG6 Gamma compensator


Primary Weapon Systems FSC556 compensator


Hera Arms Linear compensator

Compensators disperse gas which counteracts muzzle rise (vertical recoil), allowing for less time in restarting your aim and easier follow-up shots.

The downsides are similar to those of the muzzle brake; Loud and not known for mitigating muzzle flash.

Hybrid Devices

Daniel Defense muzzle climb mitigator (gen 2)

Strike Industries JCOMP (gen 2)

Strike Industries Triple Crown comp

These are often devices which combine, often two, designs of muzzle devices into one.

Usually I see hybrids of compensators that deal with muzzle rise (vertical recoil) while also assist in reducing felt recoil.

I have also seen some which are marketed as compensators, but state they also reduce muzzle flash, so that might be a real option as well. I can’t say from experience, so test if you wish.

This VG6 Precision Epsilon is one of th products which claims that it achieves the true combination of all three muzzle devices in one. I cannot confirm, nor deny since I have never used one myself.

If I ever get the money, I'll test out a variety of these to make note of in more books in the future.

The Strike Industries King Comp states that it also performs as all three device options in one, at least from where I first saw it.

I am not sponsored by SI, I just thought it seemed worth mentioning since they have a fair amount of 'hybrid' devices.

Be vigilant when browsing for a muzzle device, because a lot of places will often confuse muzzle brakes and compensators for essentially one in the same, but that's not the case.

For the TLDR:
If you're concerned with muzzle flash effecting your vision, operating at night or in any scenario in which you wish to keep your position as covert as possible, get a flash hider.

If you want to reduce felt recoil because maybe you're running a larger caliber in your AR, or maybe just want to prevent sway, get a muzzle brake.

If you want to do a lot of mag dumping or rapid fire while still being accurate, get a compensator.

If you require more than just one of these has to offer, look into some hybrid devices and find what seems best for you.

Keynote for anyone considering getting a barrel under 16 inches, but not interested in registering your rifle as a short barrel rifle.
An age old trick to that is getting a muzzle device which adds the length required to hit 16 inches and above and welding it to the barrel, essentially increasing the size artificially.

Before moving to the next subject, it needs to be established that certain calibers of muzzle devices require certain threading to actually fit on.

For .223/5.56, you’re looking for a thread pitch of 1/2″ x 28.

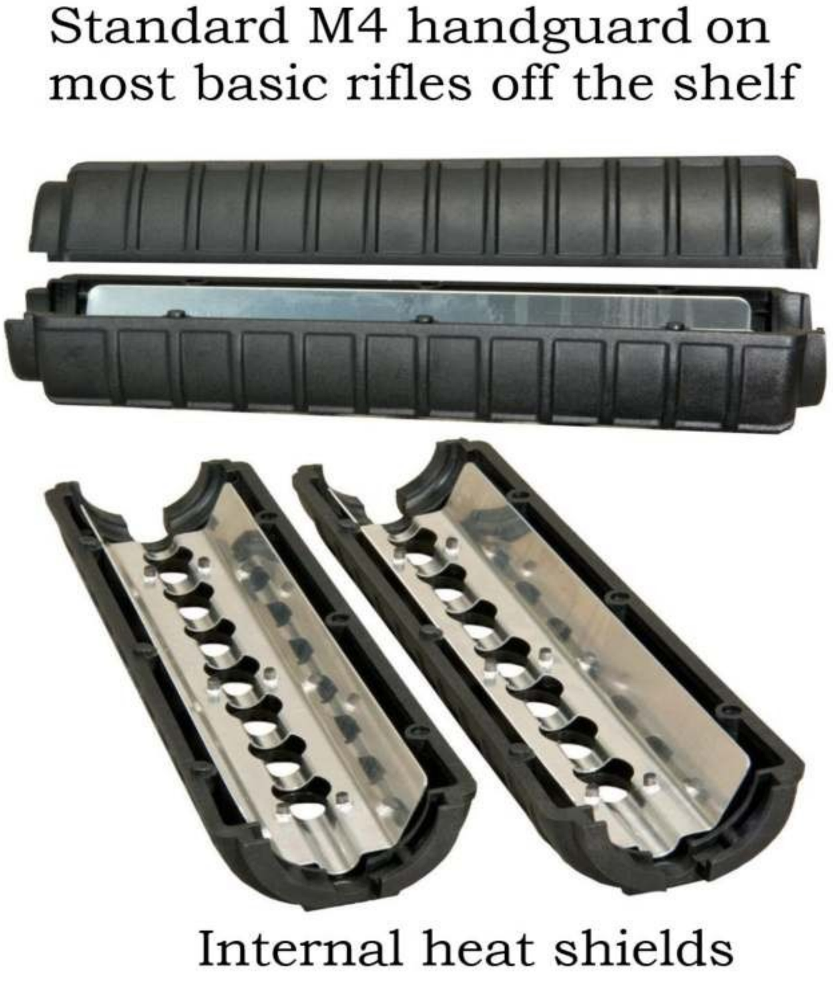
That is the pitch every .223/5.56 barrel should come with, and the thread will obviously be different with different calibers, such as 7.62x39mm being a 5/8x24 thread pitch, and so on.

Just make sure your muzzle device matches the thread pitch on your barrel and that you have whatever additional parts required to attach it prior to doing so.

Handguards

For those of you who are new to all this, a handguard is a specialized barrel shroud which serves two primary functions:

1. To prevent the user from getting burned by the heat of the barrel while using the gun.
2. To provide additional space for attachments.



The most basic set ARs that you can get off the shelf typically come with
a plastic handguard with internal headshields.
Those are falling a bit out of fashion, for several reasons you may understand as I go over this subject.

These are also made in longer lengths and if you browse for authentic pieces to make an A1 replica, you can find some of the classic triangular handguards those used before the rounded ones started becoming the standard replacement.

There are more modular options on the market today, making those plastic ones seem pretty obsolete.

But first, I should cover the two versions of handguards since that will likely effect your build more than anything else.

Drop In vs Free Float

Drop in handguards use two pieces which connect together, along with using the delta ring and handguard cap.
The plastic one above is an example of a drop in handguard.

The pros of drop in are that they are often cheaper and more lightweight than their free floating counterparts, however, the main con is that they are wobbly and can effect accuracy by sights, lasers, etc, canting around when in use.

No, you cannot just tighten it to make it stop.
It’s an inherent flaw.

It’s because these handguards require the delta ring to sit on, and due to the circular design, causes the wobbling.

Free float handguards attach to the upper receiver by screws that secure around the barrel nut, meaning the handguard is gonna be as steady as that upper receiver is.

Although free floats tend to require specific barrel nuts to secure properly, but I assume most of these come with them if you order the kits anyway. Just be aware.

Now the weight is a given because they're often made of aluminum, whereas drop in can be made of plastic.

Some will also vouch for drop ins by citing they are easier to install, and while that is the case, taking the time to learn how to properly install a free float handguard seems well worth the accuracy it prevents from being lost in my mind.

Keymod

Monstrum Tactical free float keymod handguard (10")

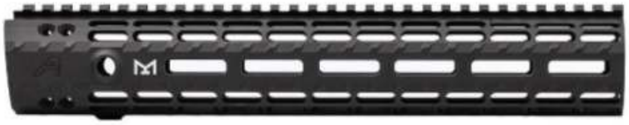
Daniel Defense keymod Omega rail (9")

Davidson Defense heavy duty keymod handguard (12")

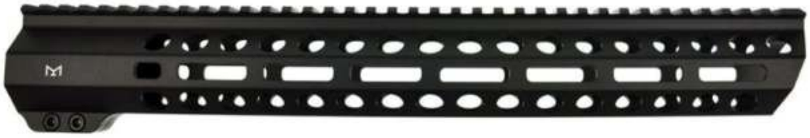
Outdoorsportsusa ultra slim keymod handguard (7")

You’ll notice that all three of these options have rails on the top, and that’s the same railing (known as 1913 Picatinny) as your upper receiver (assuming it’s flat top) will have.

Mlok

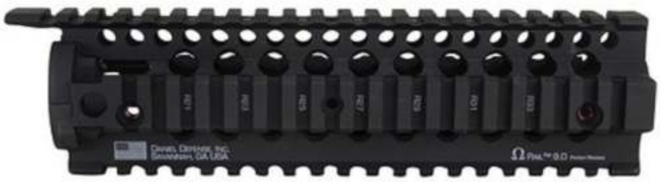


Aero Precision enhanced m-lok handguard gen 2

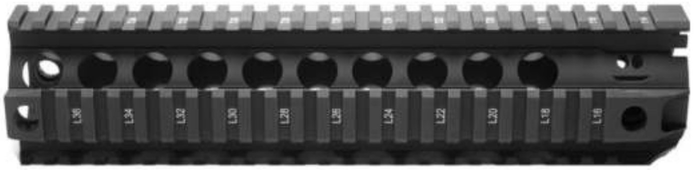


Lakota Ops "Exectutive" m-lok handguard (15")

Quad Rail



Daniel Defense Omega quad rail



BCM QRF 10"

There are no particular pros or cons with any of these besides personal preference.
All have picatinny rails on the top.

You can get picatinny rail adapters for both keymod and m-lok, as long as it’s the right kind of hardware for each.

Quad rails, as the name should imply, have four segments of rail all around.

And if you don’t want to opt for picatinny on keymod or mlok, you can get attachments which are designed solely to their design specs, so just be aware of what you’re looking for when trying to get a foregrip, laser sight, whatever it may be.

And do some research on just what length of handguard would be the most optimal since different barrel and gas tube lengths can effect just what may or may not be compatible with your set up.

If you opt for something like a front sight block (A2 front sight), you can also get handguards with a segment of railing cut out so the FSB can sit between the rail segments and still allow you to attach whatever else around it, or just get a handguard with length that won’t interfere with where the sight block rests.

Although one suggestion I can think of is if you don’t use your rifle as much or don’t plan on running much of anything on it, then maybe just opt for some cheap plastic M4/M16 style guards.

UPPER RECEIVER: INTERNALS

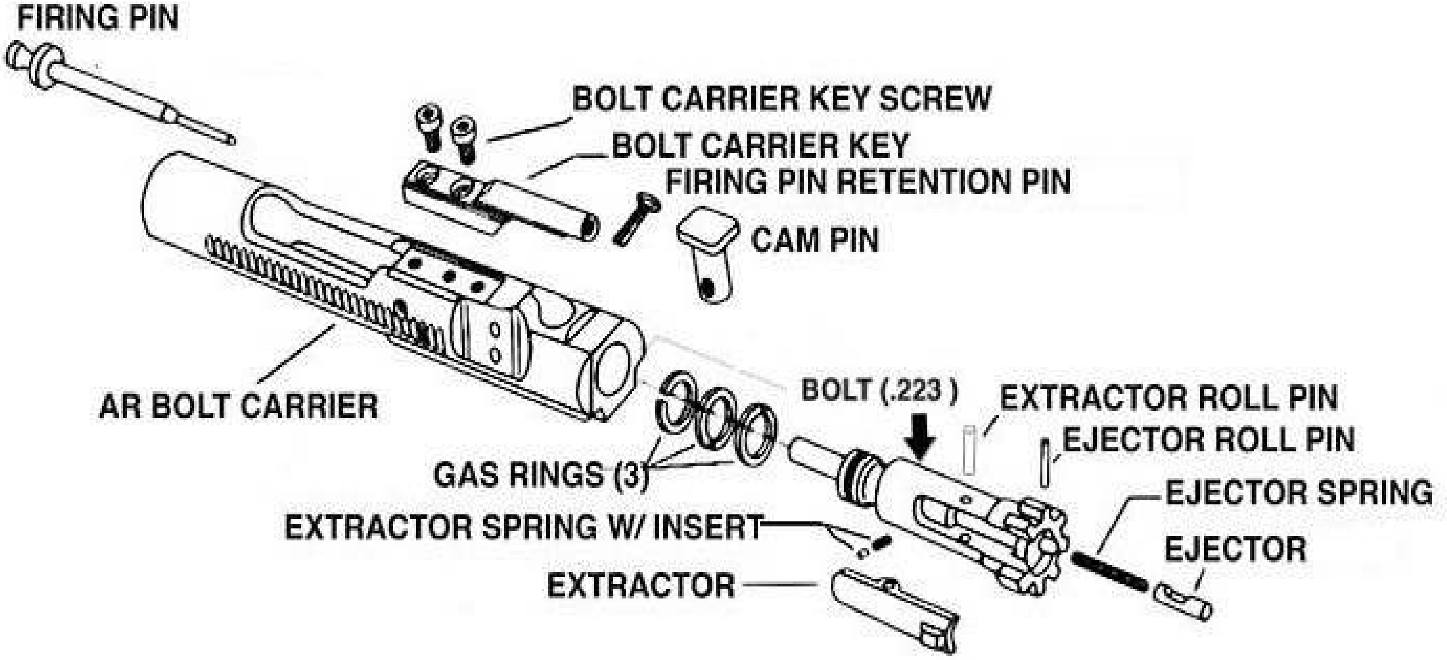
There are two main components to the inner working of the upper receiver assembly that are broken down into even smaller ones.

Bolt Carrier Group

The purpose of this should be self explanatory.

But if not:

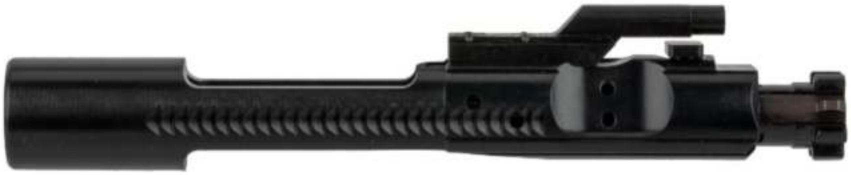
The bolt carrier serves a few purposes.
To trip the sear allowing the gun to fire, to push back into the recoil spring from gas pressure to cycle another round, etc.



All of these parts should be available from most suppliers, if not available in bundles.

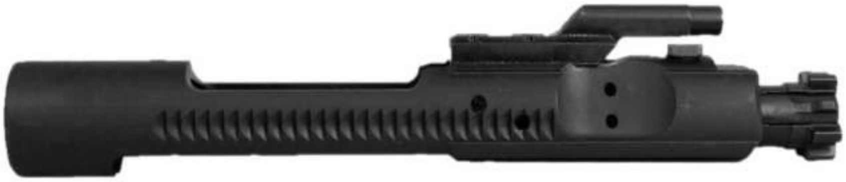
Of course, you can simply get a complete bolt carrier group with all parts included and assembled if you rather not deal with putting it all together.

Full-Auto BCG



M16 cut

Semi-Auto BCG



Half cut

Firstly, I must cover the different types of bolt carrier groups available.

In the visual example above, the two AR15 ones are simply semi-auto variants, and the M16 is the full-auto cut.

The difference?
The extra portion of cylinder at the end on the M16 cut is to trip an auto sear, whereas the cut down AR15 cuts cannot.

M16 bolt carriers do not convert your rifle to full auto, as they require all the other M16 style lower parts to actually function in that way, along with an auto-sear.

So what about which is better for general use?
I can't say from experience with the semi-auto ones, I just know there's a good amount of M16 styles available for often under $100.

Perhaps also consider the weight of the carrier because although it may not be the biggest factor in tuning your rifle's gas operation with all the cyclical operation suggestions covered before, it can have some effect with its weight.

The main materials you'll find consist of steel, aluminum and titanium. Apply the general idea to these metals in everyday life as you would to these bolt carriers.

Steel is common and durable, aluminum is lighter, titanium is likely the best for the longest use but on the pricier side of things.

Then there are three common coatings:

Parkerized, nitride coated and nickel boron.

Parkerized is said to be the most economical, providing corrosion resistance and durability.

Nitride hardens the steel, adding to corrosion resistance, reducing friction and increasing life span.

Nickle boron has very good corrosion resistance, is said to be nearly friction free.

I also hear can be easily cleaned just by wiping it down with a rag.

I'm not going to cover every component of the BCG since most can be ordered already assembled and you can easily find resources online on putting it together yourself if you ever require to.

If you do decide to take on assembling one yourself, this guide should help.

https://www.itstactical.com/warcom/firearms/diy-ar-15-build-bolt-carrier-group-installation/

(No affiliation.)

Charging handles

The charging handle is to manually cycle the bolt when loading and unloading, as well as dealing with jams when a spent casing gets stuck on its way out, or if you happen to encounter bad ammunition.

Presma ambidextrous charging handle

NBS billet charging handle with extended latch

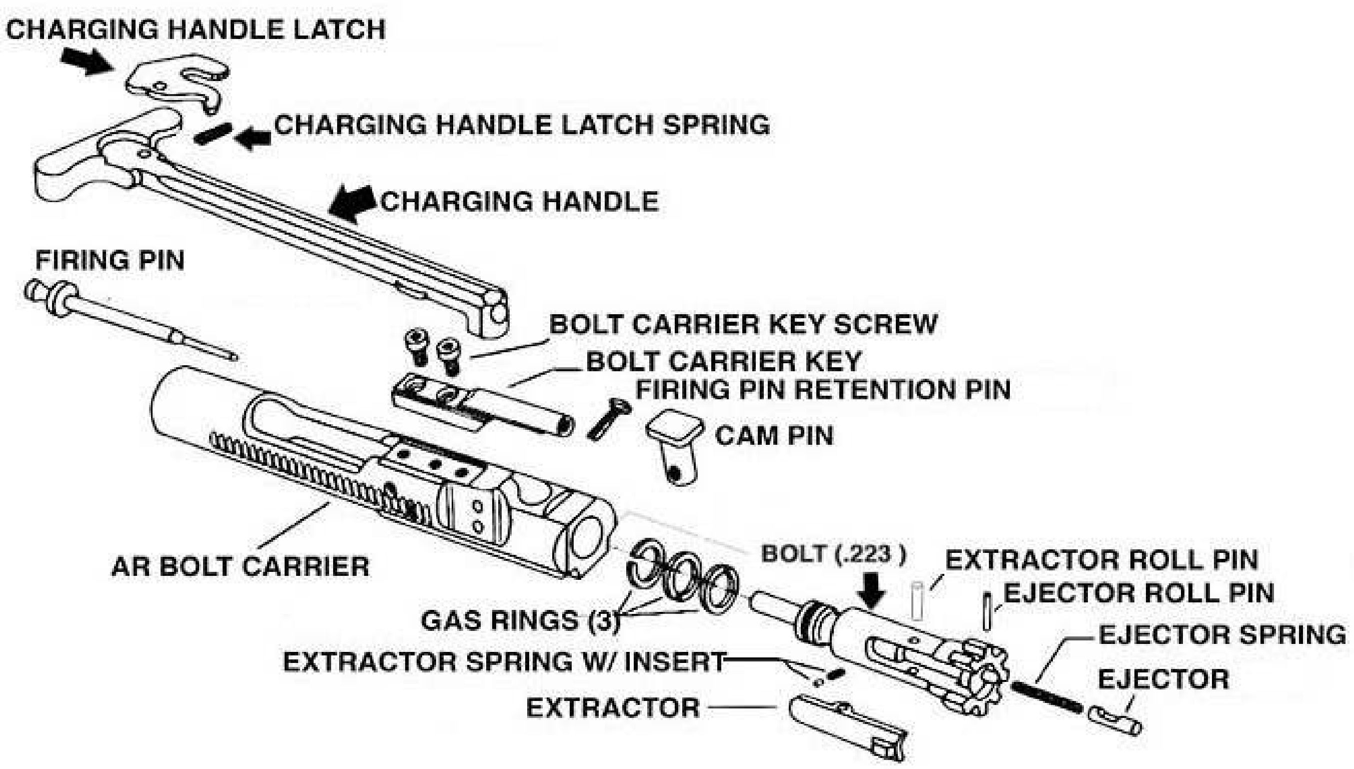
Radian Raptor-SL ambidextrous charging handle

Fortis Hammer charging handle

Their is minimal variation in those available, as the general design cannot be modified very much from what it seems.

The most custom thing these will have is the engraving on the top, aside from that the base design is always similar.

The operation of a charging handle works because it sits above the bolt carrier group like this diagram:



A lot of new comers to ARs, and probably guns in general, make the mistake of following their hand down with the charging handle as it goes back into the forward position.

What you're really supposed to do is pull it back and let it go.

https://gundigest.com/rifles/ar-15/ar-basics-mastering-the-nuances-of-charging-handle-and-bolt-release

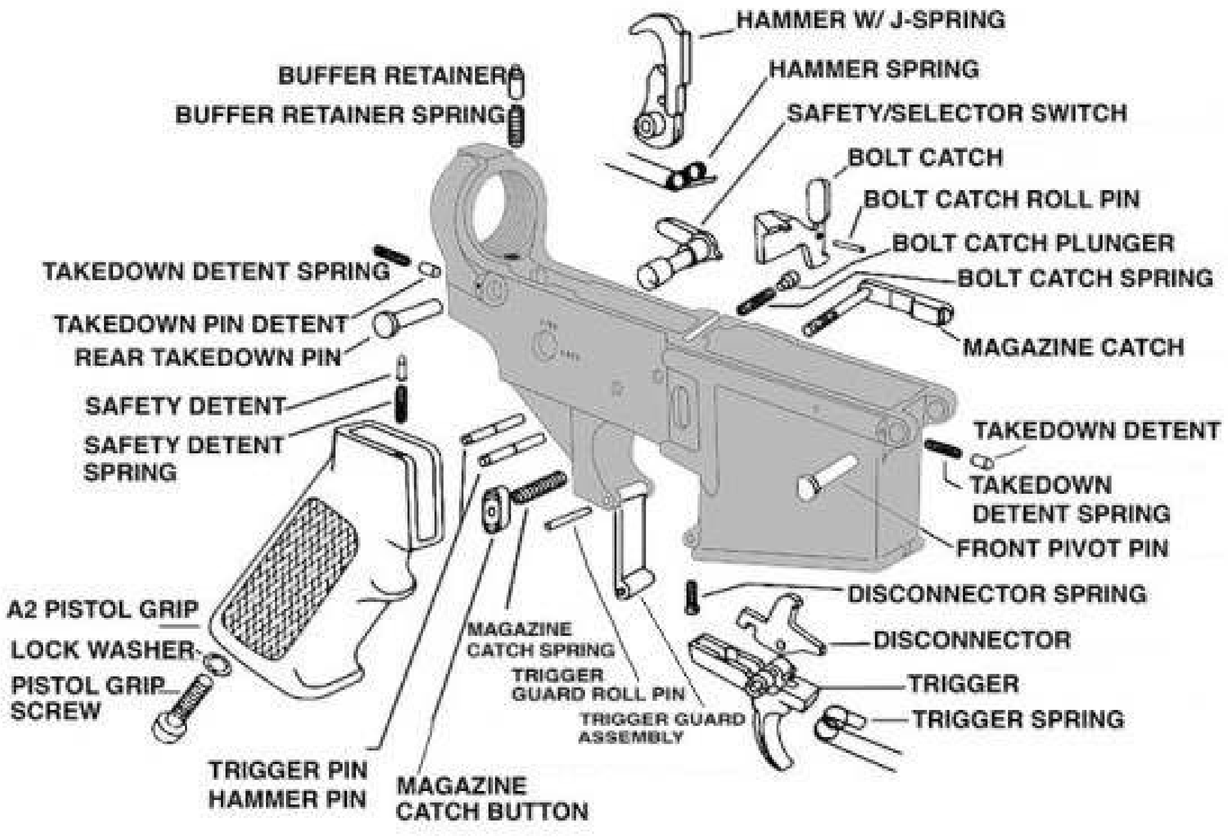
(Still not associated.)

Now that all the parts are covered, it's time for the building section.

BUILDING IT

Prior to the assembly, here's a checklist:

- Your 80% lower
- Lower parts kit (trigger, hammer, disconnector, everything else shown here):



- Buffer assembly (Buffer weight, tube, recoil spring, castle nut and end plate)
- Carbine/Rifle stock
- Bolt carrier group (refer to page 97 for diagram)
- Charging handle
- Upper receiver

- Forward assist assembly (optional by upper)
- Dust cover assembly
- Barrel, barrel nut, snap ring, weld spring
- Gas block and tube
- Muzzle device and crush washer
- Handguard, handguard cap and delta ring (if drop in handguard)

TOOLING

You can't just put all this together by hand necessarily.
There are tools that you should also be using.

- 80% jig (buy separate from your lower.)
- Sturdy and straight workbench
- A vise/milling vise or clamps
- AR vise block (not essential, but really helps.)
- Roll pin punches (3/32", 1/32", 1/8", 5/32")
- AR armorer's wrench
- Nylon hammer (or gunsmithing hammer)
- (Very helpful) Needle nose pliers
- A torx screwdriver that's at least 3" long (exact screwdriver depends on your pistol grip screw; A T-screwdriver really helps.)
- Magcatch tool or anything you can use to hold it in place

  (pretty sure I used a brass punch.)
- Drill press, router, cnc or hand drill (I'm explaining the drill press way.)
- Dremel tool and file (not essential, but helps to finish with.)
- Lubricant (WD-40 works.)
- Drill bits (Usually 1/"8, 3/8", 5/32", 5/16" long end mill, 3/8" long end mill, 3/8" short end mill; Last one depends if your lower has the rear shelf milled already or not.)

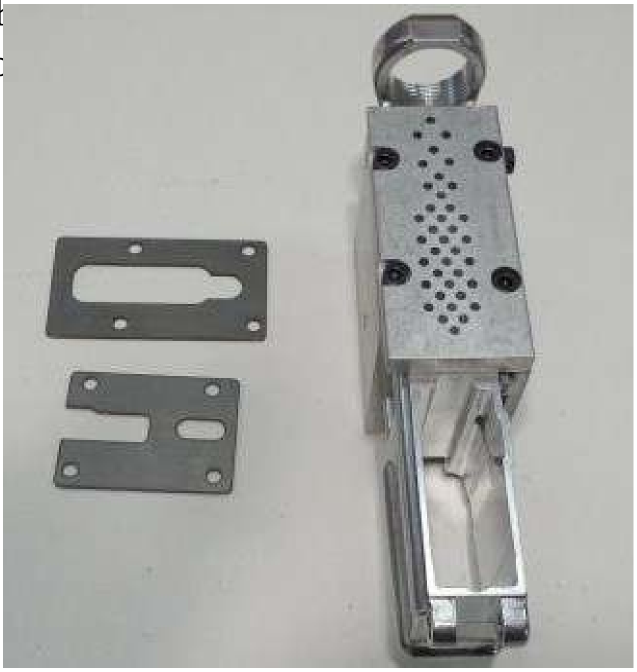
That should do it for the checklist.

But doing over those drill bits; Those will depend on what machine you plan on using because different manufacturers make different bits for routers and drill presses, probably the most common options for finishing 80% lowers, and since I only have experience with drill presses and that's likely what you may already have, that's what I'm covering.

For jigs, I would say opt for the metal ones since polymer ones like Polymer80 sells only work after one use, so if you make a mistake in the process, you'll need to get another jig.

(I'm gonna pass on demonstrating how to install a trigger guard on account of my lower having a built in one, but the amount of guides online should be more than suffice for it if you need any.)

This Anderson jig will serve as th example of what to try looking fo I can't vouch for this one personally, but if you plan on making more than one AR, and after studying this guide you likely will want to, you better opt for a metal one of some kind.



Typically they'll come with a few different plates held in place by screws, which will cover the top of your lower. These plates have guides for different sized drill bits to mill into.

So start small and size up like you would any other time you're drilling a hole in metal.

Then you may be wondering what the small hole is for. That’s for drilling out the pocket your trigger is gonna protrude through.

You can also get drill bits which have a line marked for when to stop drilling so you don’t cut through the bottom of your lower, or get a gauge that keeps the bit from going further than it should. Neither of these are necessarily required, but would help a lot.

Make sure you’re wearing eye protection, as there can be some flying bits of either aluminum or polymer during this.

Milling

Technically, you could just mill this all out with a hand drill, but I would suggest using a drill press for more stability if you have the option.

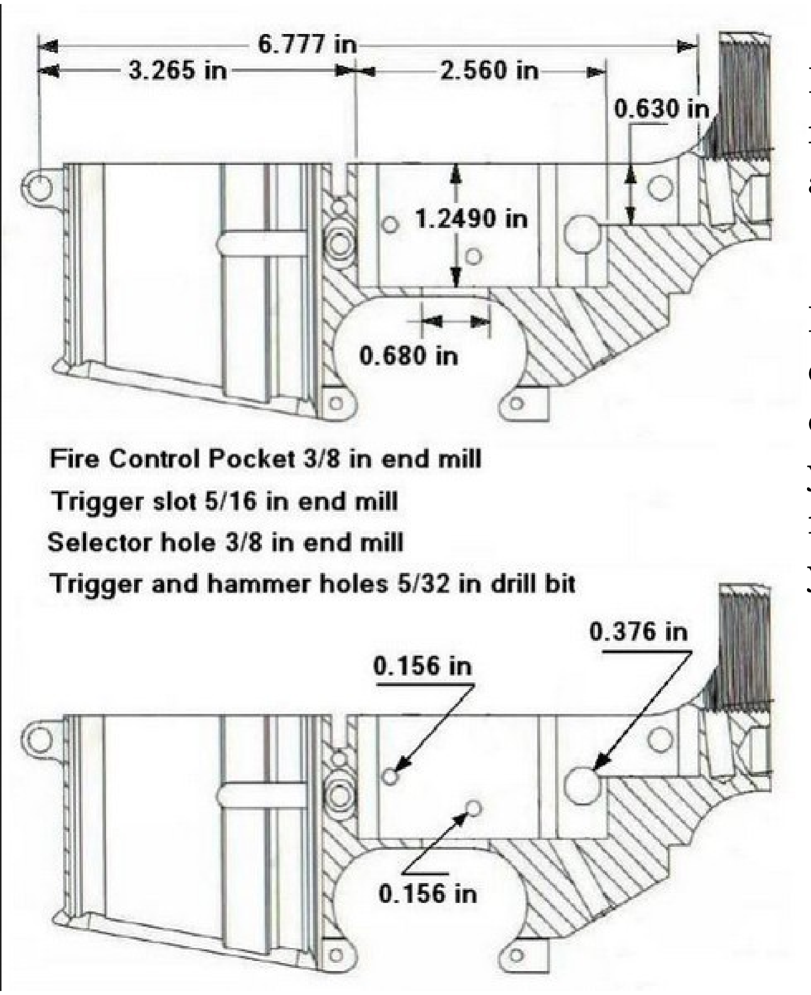
The holes you're looking to drill are the entire cavity for the fire control group (trigger, hammer, disconnector), the pin holes for the pins for your trigger, hammer and disconnector and the safety selector hole.

If you can help it, I suggest drilling these holes vertically rather than horizontally by setting your jig on its side and working on the pin holes and selector switch hole first, then getting into the fire control group cavity.

The plates will determine how you mill out the lower and different manufacturers make different plates.
Some don't even include the small one, so keep note.

Up front apologies for not having any images, as I have yet to get a new jig prior to writing this, but at least you can find several demonstrations of it online if you so choose.

The drill bits I see often used are 1/8", 3/8", 5/32", 5/16" long end mill, 3/8" long end mill and 3/8" short end mill. Will you need all? Depends on the top plates of your jig and just what material of lower you're working on.



Fire Control Pocket 3/8 in end mill
Trigger slot 5/16 in end mill
Selector hole 3/8 in end mill
Trigger and hammer holes 5/32 in drill bit

Here’s a reference guide to use, regardless of how you choose to go about the milling process.

If you at any time are worried you’re drilling too far or not deep enough, check how far the bit is going, cite your gauge or use something to measure the depth on the inside you’ve already drilled.

1. Fit your lower into the jig and secure it to your vice, or drill press by securing it with a clamp.

   (Some suggest securing your jig with drill bits in the pivot pin and takedown pin holes if the jig plates don’t have their own screws.)

2. Use the drill bit for your top plate with the smallest holes out of your set and just drill enough to leave marks to assist drilling with the larger bits.

3. Replace the top plate with the next drill bit size and continue the process until you’ve reached 1.245” deep.

Keep blowing the excess metal/polymer off your workspace as you go, making sure to also lubricate the drill bits and drill slowly as you go. Rinse and repeat until the fire control group cavity is finished.

4. (Optional) If your lower doesn't come with 'shelf' under the buffer thread already milled, you can opt for milling that as well, starting with the smallest bit your plate allows for and drilling a depth of .625"-.630", then finish with a 3/8" (short end mill) or whatever works.

5. If your fire control cavity is finished, swap out your plate for the one with the smaller hole that lays over the fire control cavity and proceed to mill out your trigger hole.

6. I suggest laying your jig on its side instead of doing this while it's upwards. Drill out the trigger/hammer pin holes with the 5/32" bit. P80's manual suggests to do it half way from one side and half way from the other. I'm not sure it makes much of a difference, but if you're concerned about a bit tilting, go the half way route.

7. While the jig is still on its side, use your 3/8" bit to mill the safety selector hole.

8. By the time you're finished, you may see some rough looking edges in the fcg cavity. Just use the dremel tool or file on those and when you're satisfied, you can move to installing the parts.

The exact order doesn’t really matter, as long as you start with the smallest drill bits for spotting the holes in the fire control cavity first and move up in bit size.

The exact bits you may need may vary, but for the selector switch and hammer/trigger pins, you always need at least a 3/8” and 5/32” drill bits.

This is more a repeat process that can take upwards of an hour in total time to complete, so just remember that patience is a virtue with this, otherwise you may run the risk of wearing out your drill bit, or worse, getting it stuck in the aluminum you’re working on. And this is only a general summary since the exact method will vary depending on your machine and jig used, if your machine requires the use of a jig.

I would have loved to help more with this part, but with the amount of jigs available, it makes it a bit hard to explain, even if I did have images on hand. (Try making sure if you search for guides to follow along with the milling process, that they’re using a jig similar to yours.)

If you’re concerned about inside coating, you can try anodizing it at home or having it cerakoted, however, both of those are out of my profession, and I will suggest you study on those if you consider taking on milling out a raw aluminum lower at home sometime and coating that once it’s finished.

Now comes the actual assembly.
Hopefully you have more lubricant on hand, because some of the tolerances of these holes are extremely tight, and I suggest coating these pins with WD-40 and forcing them in with a punch rather than trying to make the hole wider.

That was my mistake the first time I tried doing this.

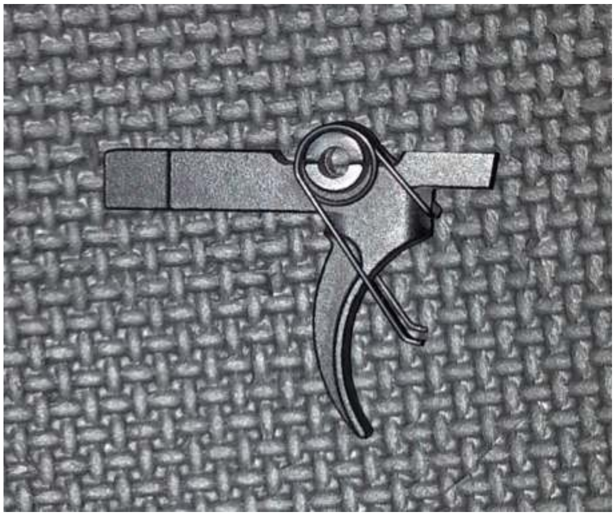
Check page 98 for the visual guide on the lower parts kit, as that alone shows where everything goes.

Lower Receiver Assembly

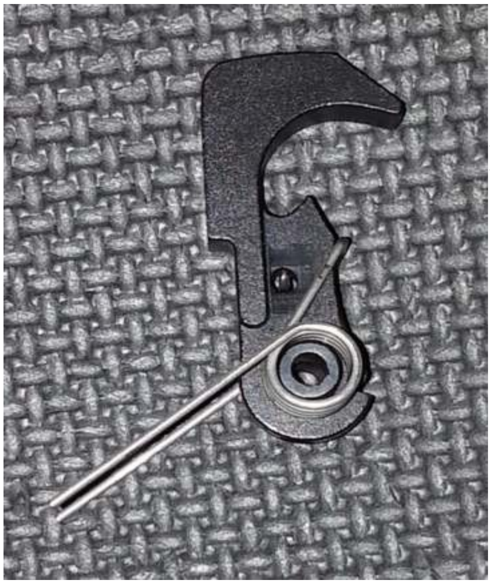
Fire Control Group

Assuming you don't have a trigger you can just drop in, here's the assembly aspect of things:

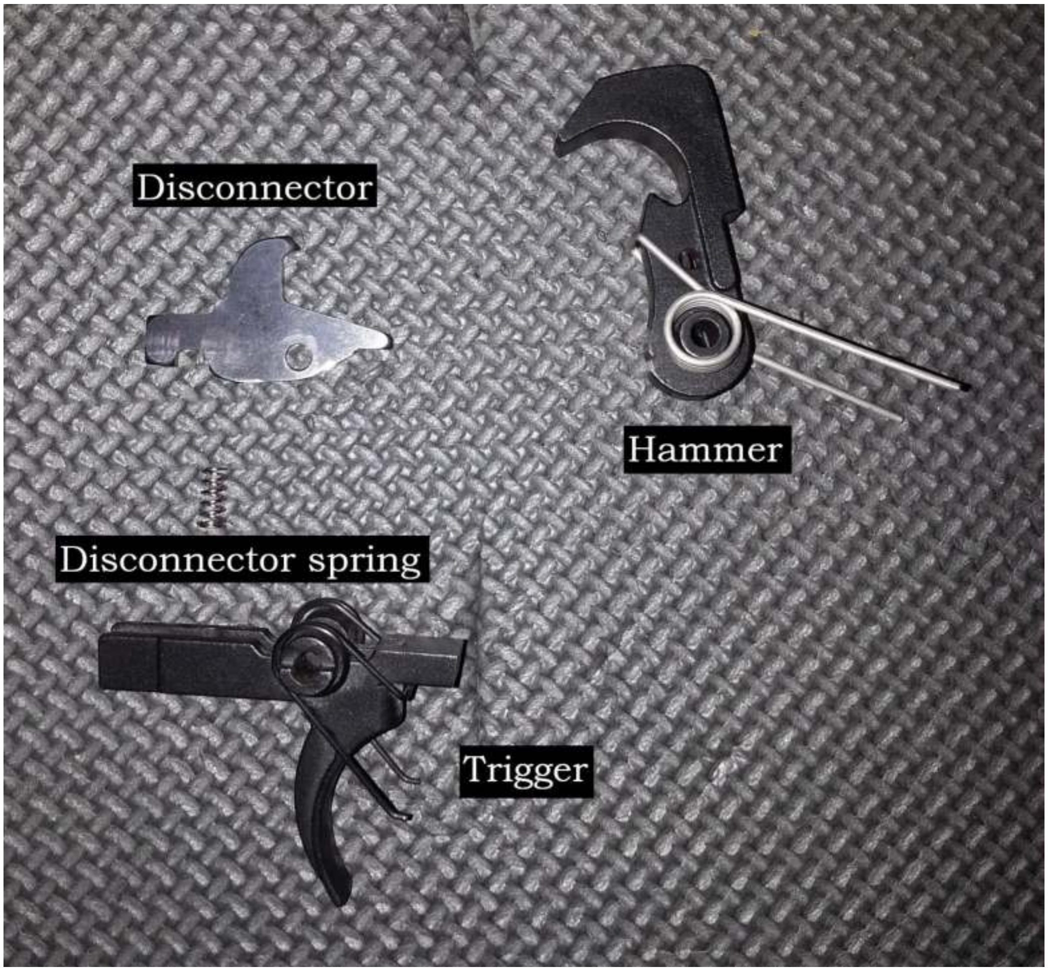
First, put the springs on in their proper orientation with the trigger and hammer.



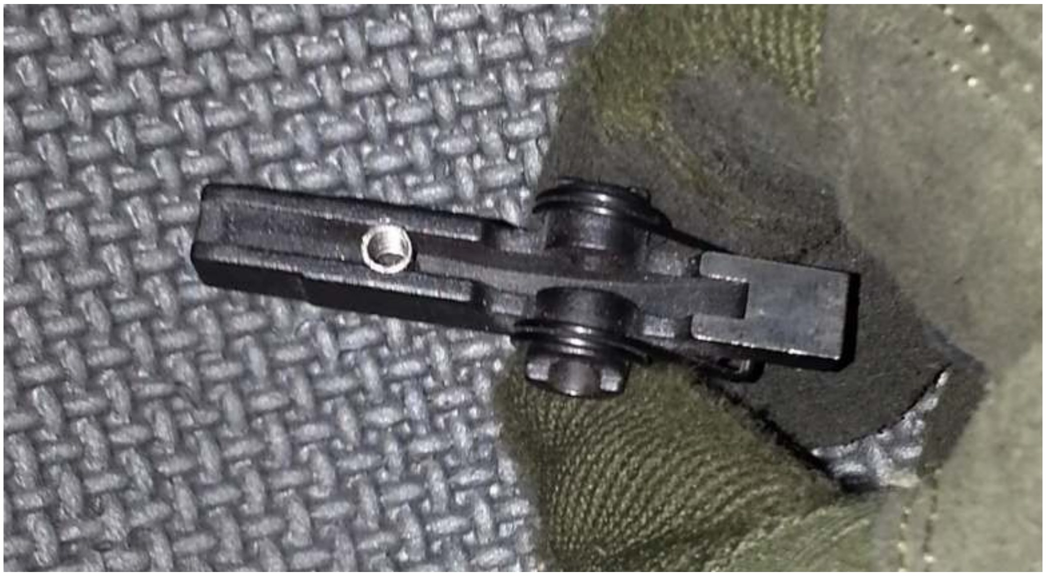
Proper trigger spring orientation.



Proper hammer spring orientation.

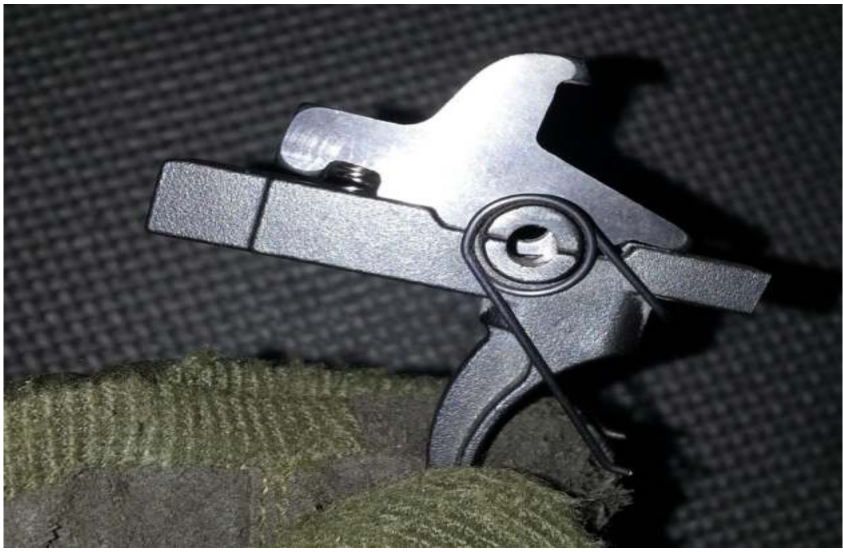


Visual of your trigger assembly (Mil-spec single stage trigger set up.)



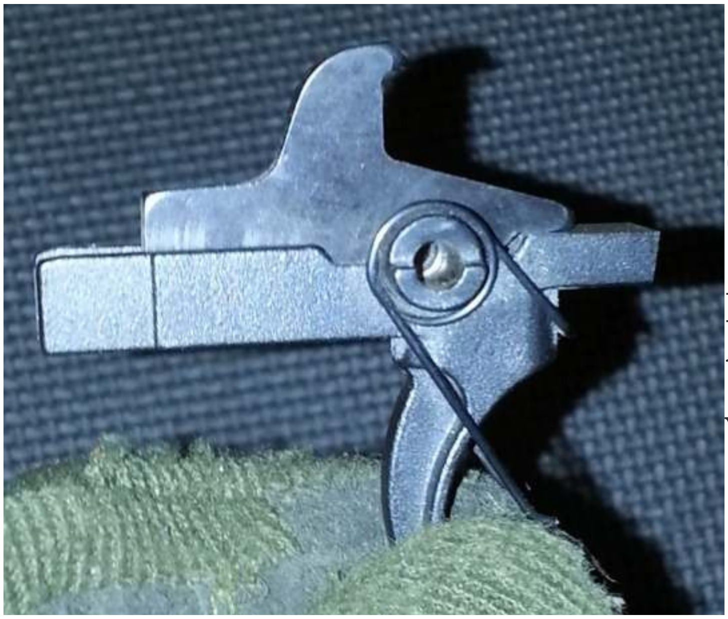
Insert the disconnector spring in the circular notch on the trigger with the wide side downwards.

Using something (like a punch) to push it down helps.



(Correct)

A way to tell if you inserted the disconnector spring correctly is if you can see it under the disconnector when it's on top of it.



(Incorrect)

If the spring is not visible under the disconnector, you put the wrong side down.

At this point you can put these in your lower, lining them along the pin holes at the sides and inserting the pins through them.
These tolerances should be very tight, so coat your pins in some lubricant and try tapping them in place with a nylon hammer. A normal hammer works as well, a nylon one just helps with not scratching the finish on the pins.

It may help to keep the lower in a vice to keep it from moving while you try inserting the pins and if the hammer alone isn’t getting you results, consider holding a punch against the pins and lightly tapping.

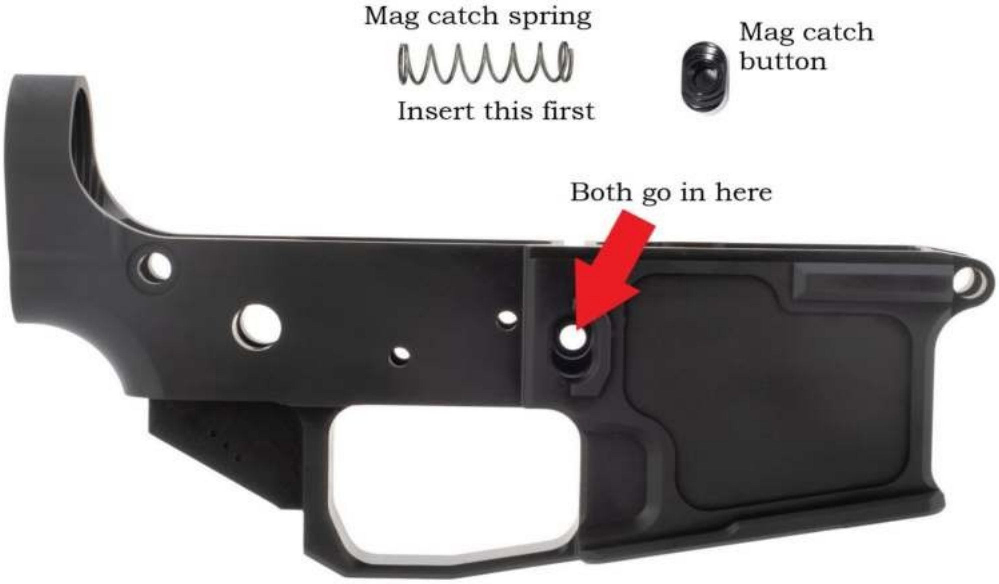
Ensure the pins are flush along the outer walls of the lower receiver by checking if it sticks out more on one side.

This is how the trigger and hammer should be positioned when installed.

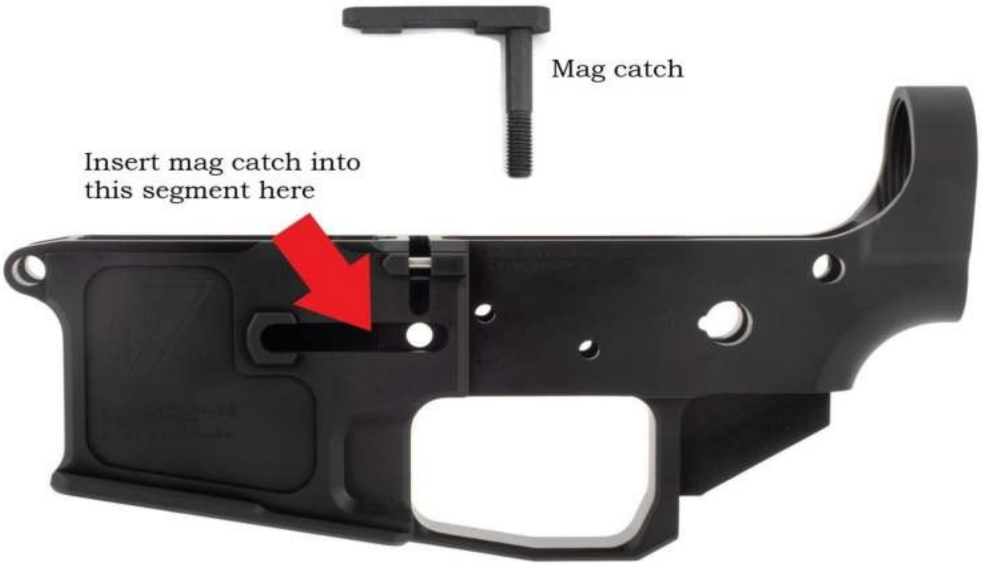
You can test this by manually cocking the hammer by pressing down until it is caught by the disconnector and pulling the trigger to see if it releases properly, but hold onto the trigger and following it if you do, because without the upper receiver on, all it will do is hit the wall of the lower, which can eventually cause damage if done enough.

The magazine catch is a very easy thing to install.

Magazine Catch Installation



You’ll notice the mag catch button is threaded in the middle, so the process here is just dropping in the spring, place the button over the spring and then twisting the bolt catch until it’s fully in place on the other side, threading it into the button.



Only insert after you've inserted the spring and button

Use a punch to help in keeping the button in place if needed, then turn the lower on its side when you attempt to put the mag catch in.

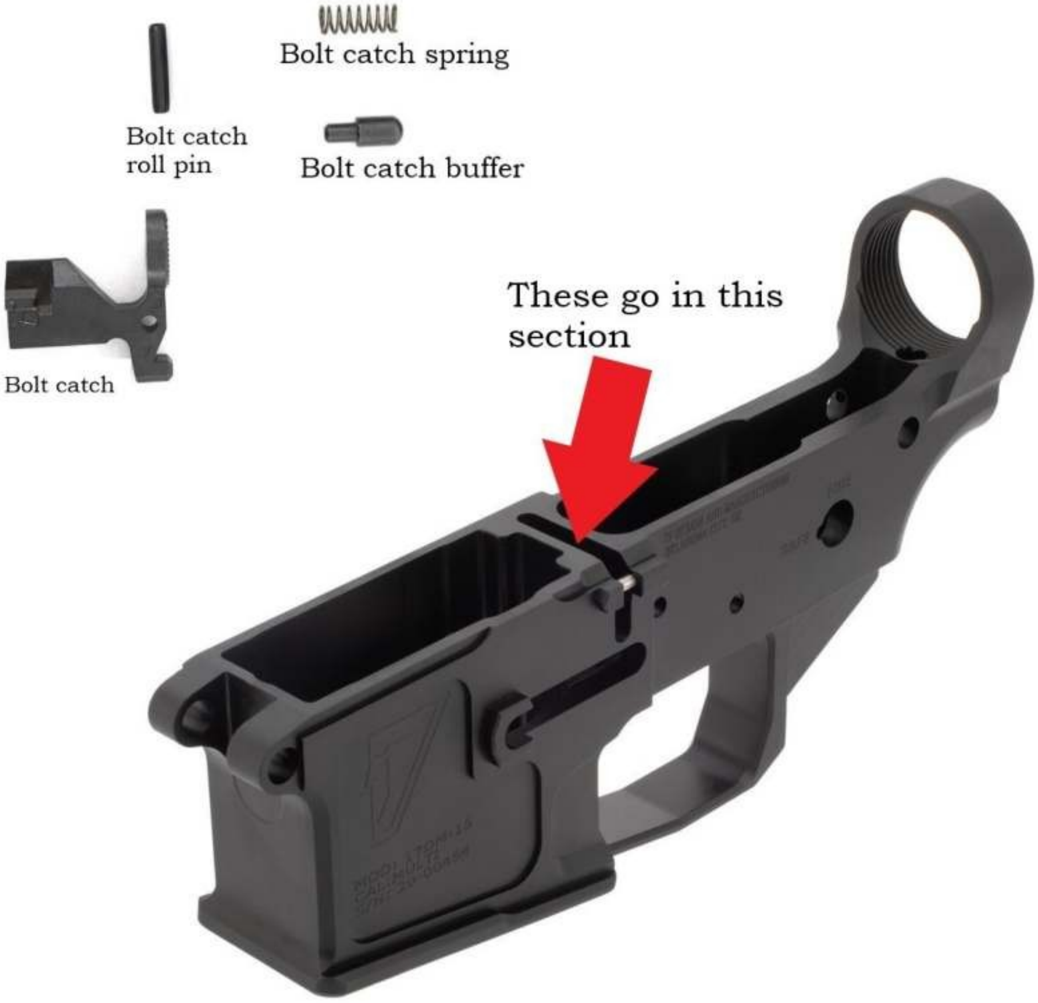
You can either twist the mag catch or push the catch flush with the lower receiver wall and screw the button on, then twist the catch. If you still have trouble getting it tight enough, just press the button into the section with a punch and twist the catch more.

To test if it functions right (if it’s tight enough), put a magazine in and do some tests seeing if the button releases them when it’s pressed.

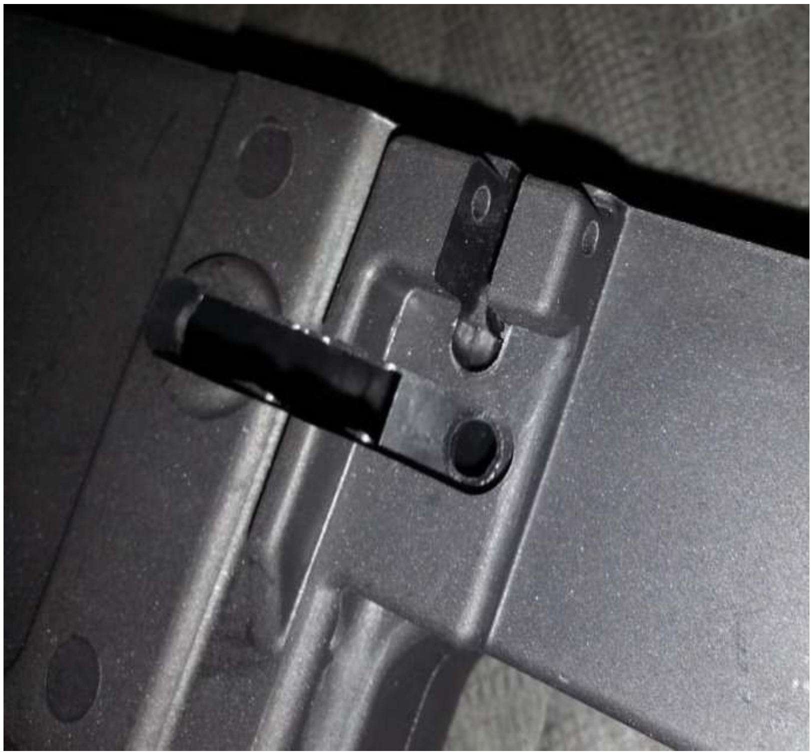
If your mags fall out before you press the button, try tightening it a bit more.

If you require to install a trigger guard on your lower, just find the roll pins (they should be different sizes to fit each hole), and just install the longer of the two first, then work the second one in with a hammer and light taps. Someone suggested starting it with a hammer and then finishing it with a c-clamp, which is very creative.

Bolt Catch Installation

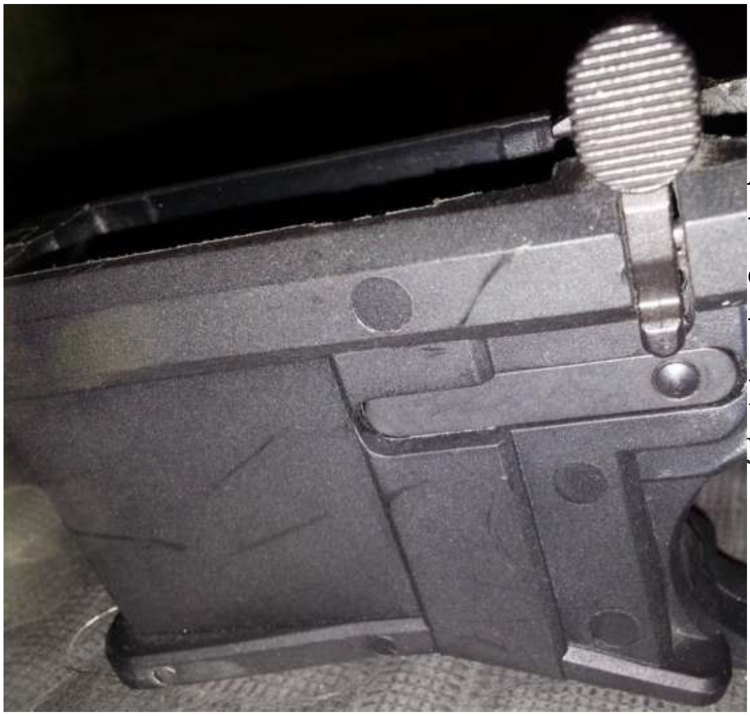


If you notice the protrusion from the notch the bolt catch assembly goes, those both have two holes, so if you ever want to remove the bolt catch you can just get a punch and push the pin out the other side. Every 80% lower should have this feature since all stripped lower receivers do, but I had learned the hard way that P80 unfortunately doesn’t, or at least didn’t with the one I bought.



Most AR15 lowers should have a bolt catch section with two protrusions to allow for replacing and removing the bolt catch.

My P80 G150 V2 does not have this feature, as the section goes into the flared wall space.=



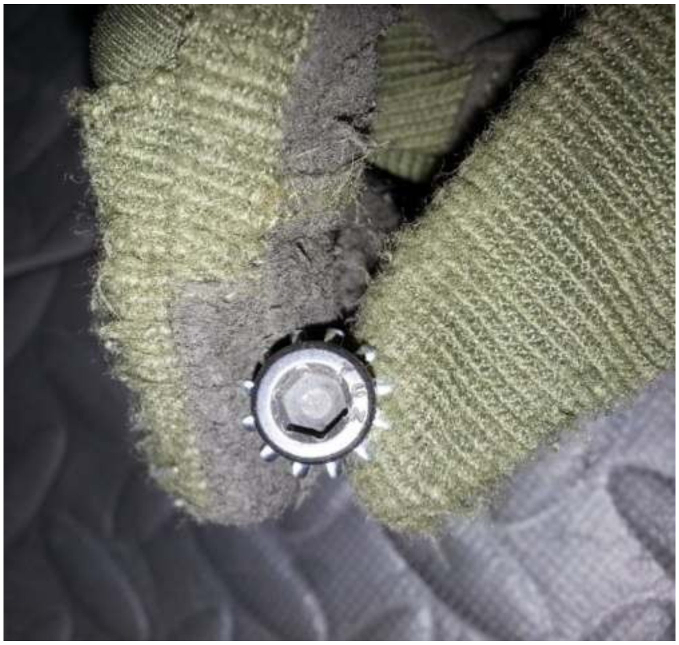
As you can see from my P80, there's no way to get that pin out once its in without just breaking the lower.

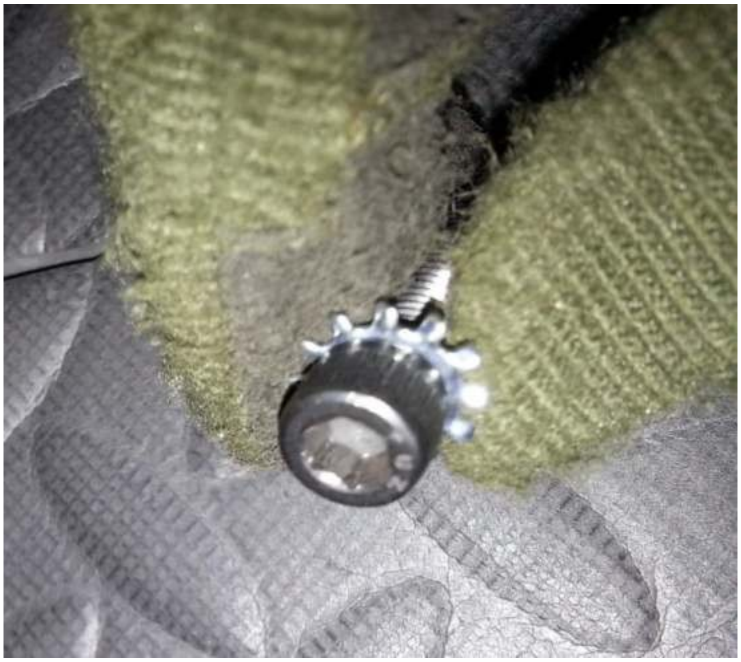
Keep note of this before buying your lower.

Selector Switch & Pistol Grip

Put the bolt catch spring in first, depress it with the bolt catch buffer, and put the bolt catch over the buffer and push it down into the cavity. Insert the roll pin through the hole.
Some may use pliers to press it from the side.

I just tapped it in place with a hammer, using a punch as a guide to accommodate for size and the positioning of how it goes in.





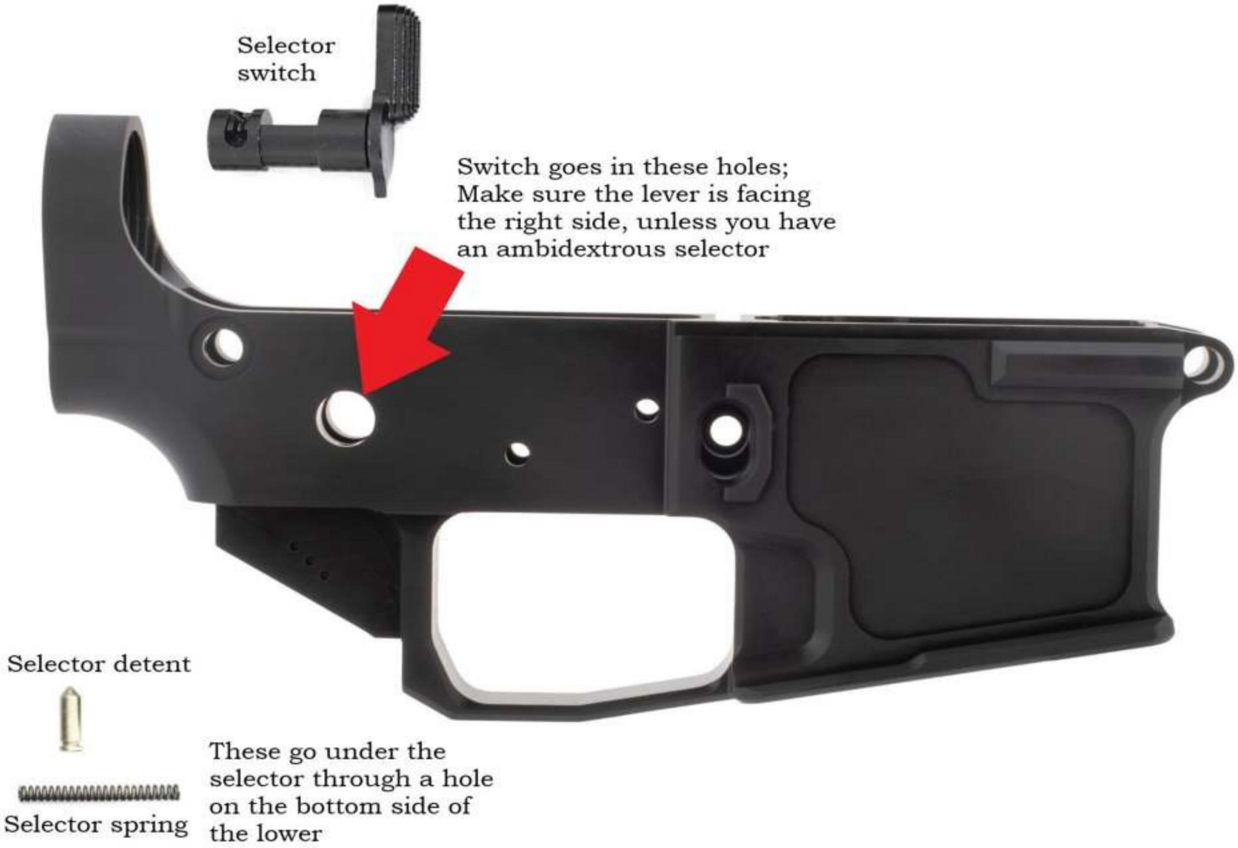
Before getting into installing the selector switch, I wanted to show the head of my pistol grip screw.

I used a torx screwdriver for installing the pistol grip.

Not all pistol grip screws are like this, my Anderson lpk actually had one that took a Philips head screwdriver, but assuming this is what most are like, I'm demonstrating for this kind specifically.

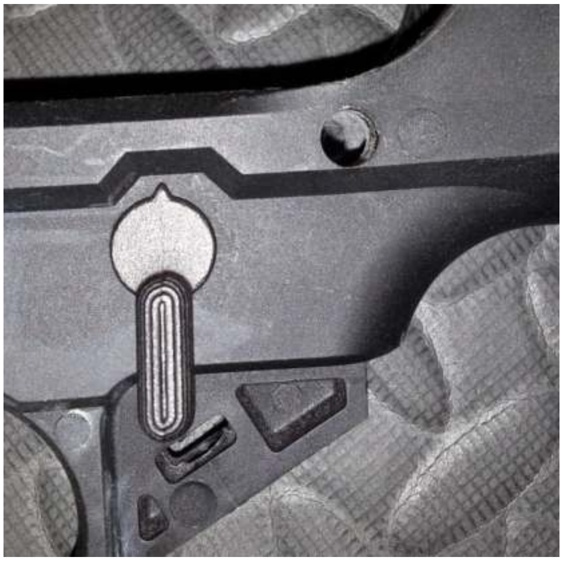
The bit I used for this should be a 3/16”.

Do a size fit check prior to trying to install the screw.



Switch goes in these holes; Make sure the lever is facing the right side, unless you have an ambidextrous selector

These go under the selector through a hole on the bottom side of the lower

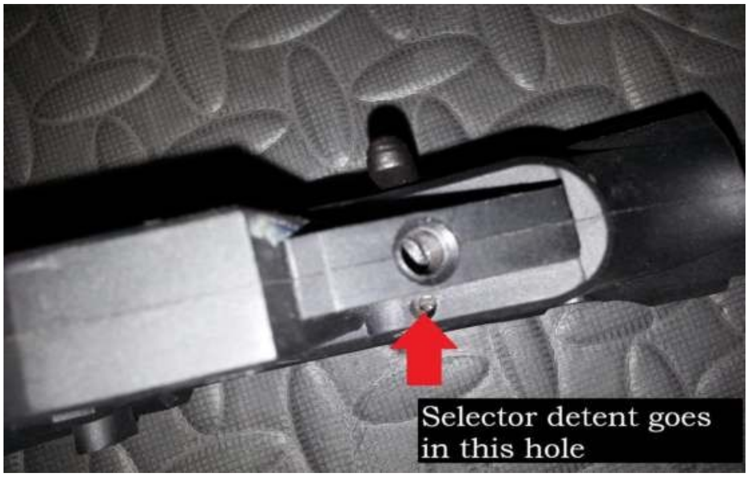


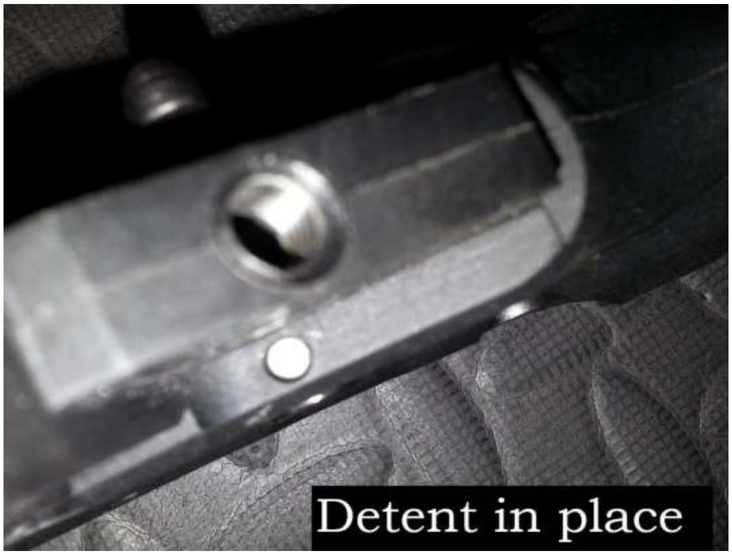
Insert your selector in the “fire” position.

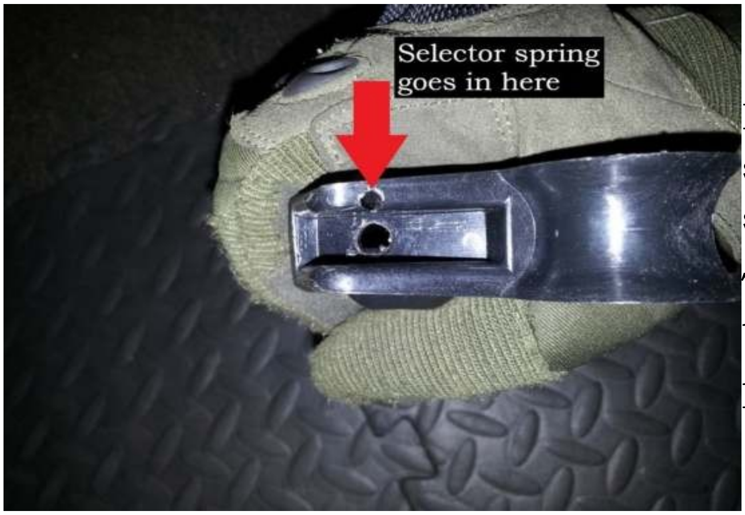
(Where the little arrow points upwards.)

From there, you insert the selector detent into a hole on the underside of the lower and this can get a bit tricky, so consider those pliers or tweezers if you need to.

(Pointy side goes in.)







How the pistol grip relates to your selector switch is this notch to the side.

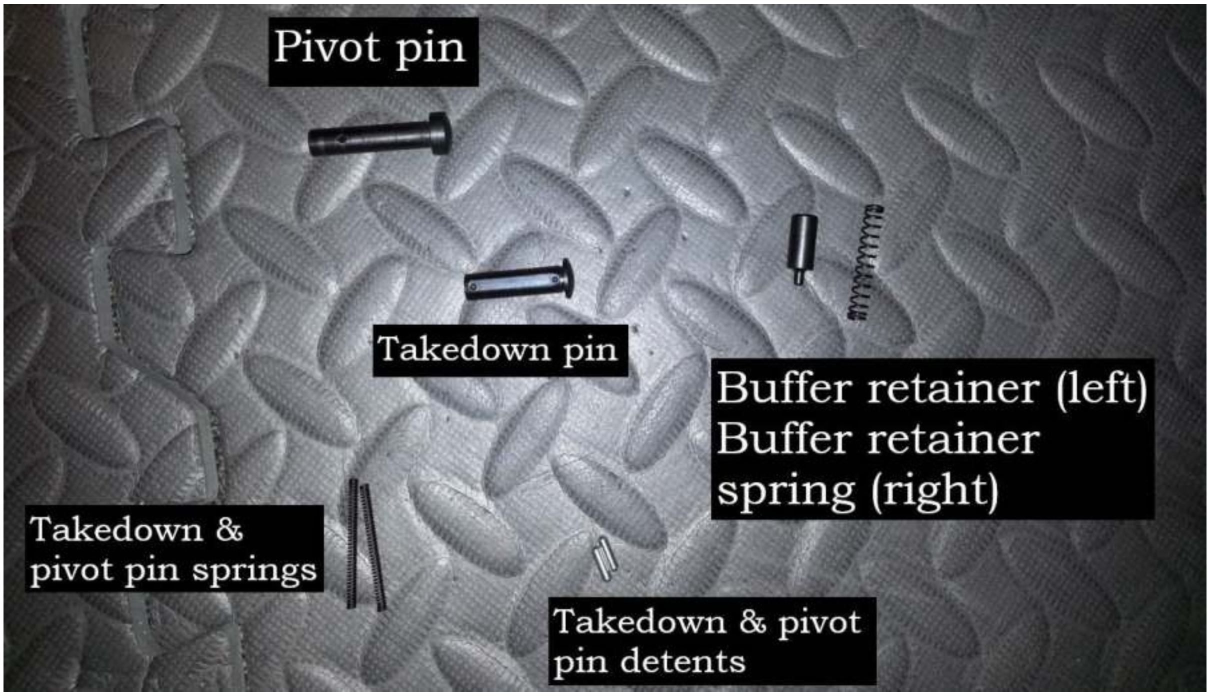
The selector spring goes under the buffer, so the grip holds them in place.

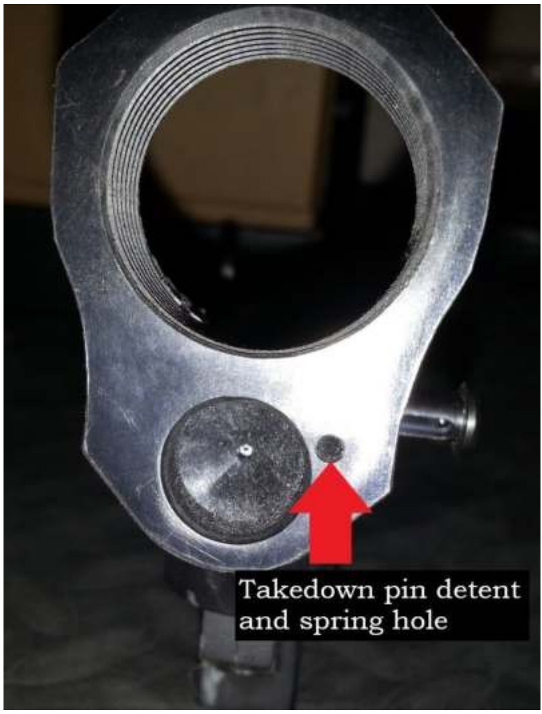
Now just put the pistol grip against the bottom segment with the screw hole and the spring should line right up with the bottom of the detent.

If there's a little force required to get the grip on the section all the way, that means there's a good tight fit, so don't worry about that.

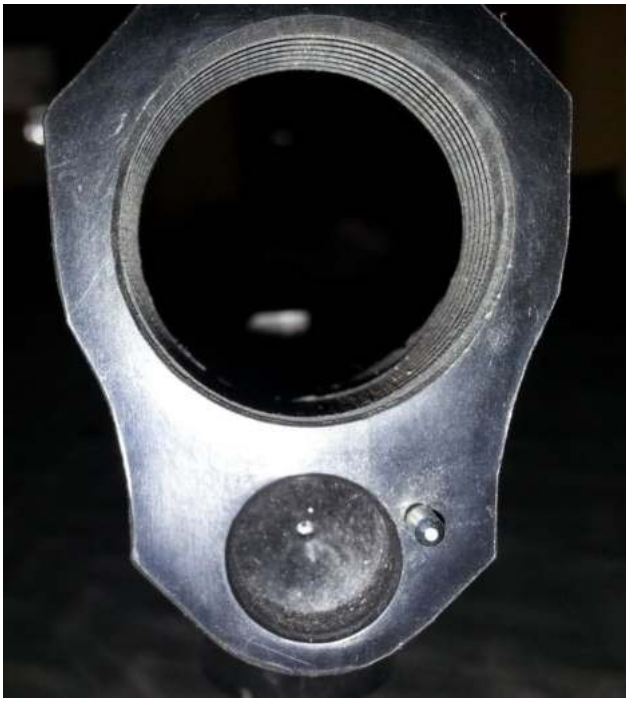
Now find your takedown pin and insert it along with its detent in the back of the lower, near the buffer threads.

Pivot/Takedown Pins & Stock Assembly

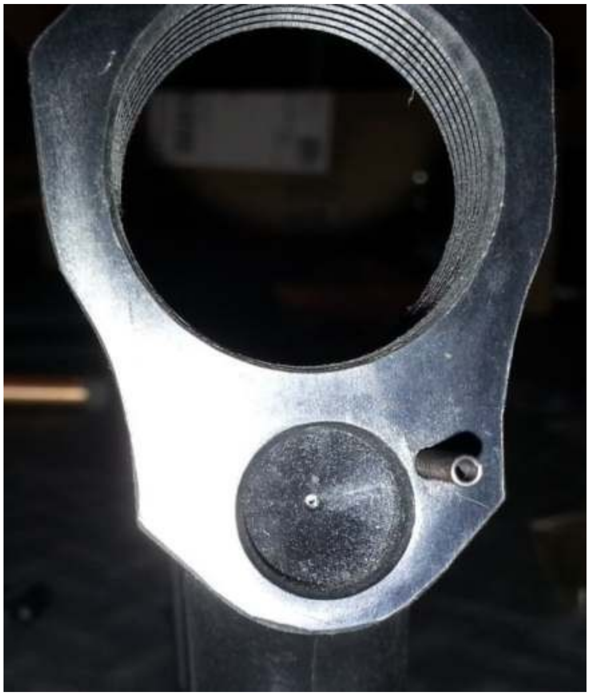

Pivot pin
Takedown pin
Buffer retainer (left)
Buffer retainer spring (right)
Takedown & pivot pin springs
Takedown & pivot pin detents

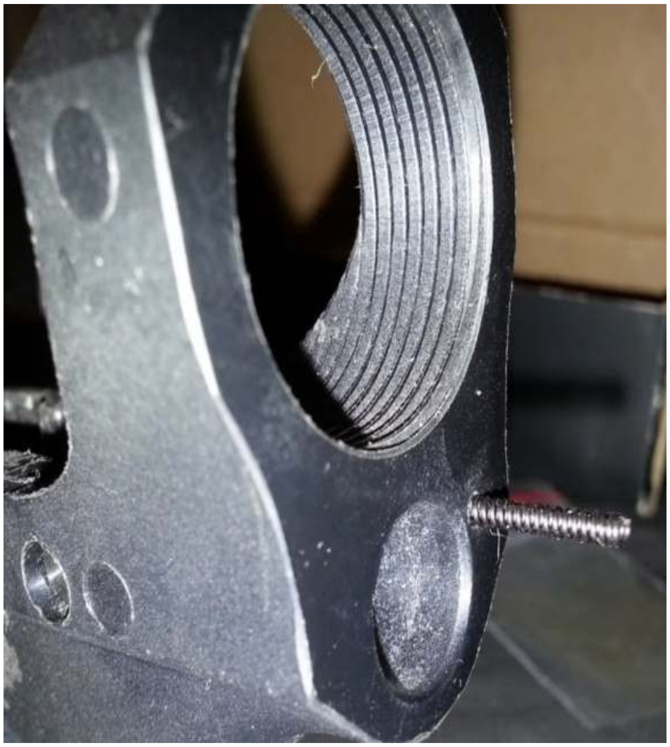


Put your takedown pin detent in the hole and follow the spring after it.

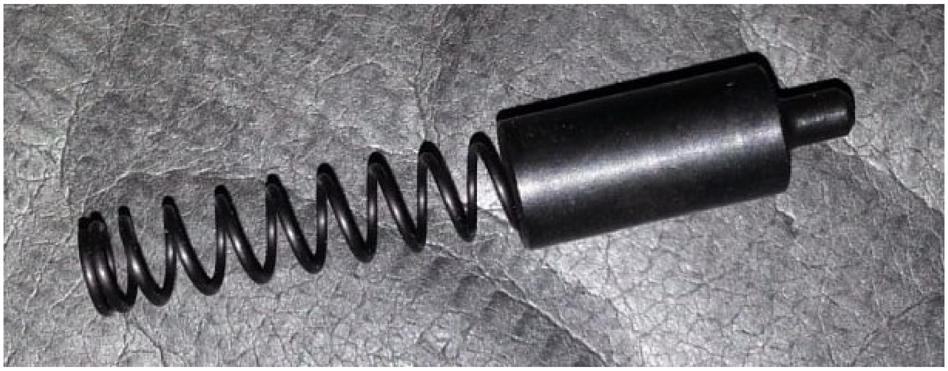


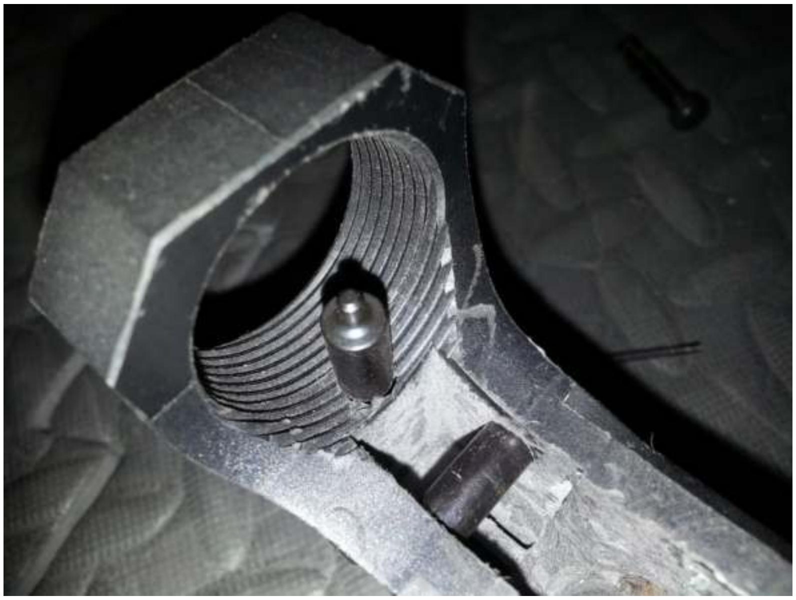
Detent in place, get the spring.



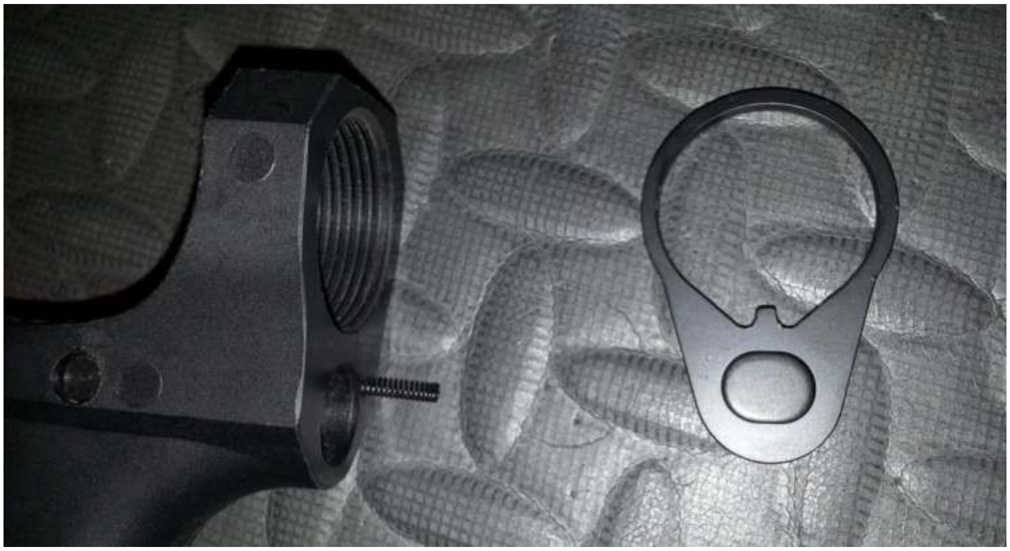


Put the buffer retainer on the buffer retainer spring.

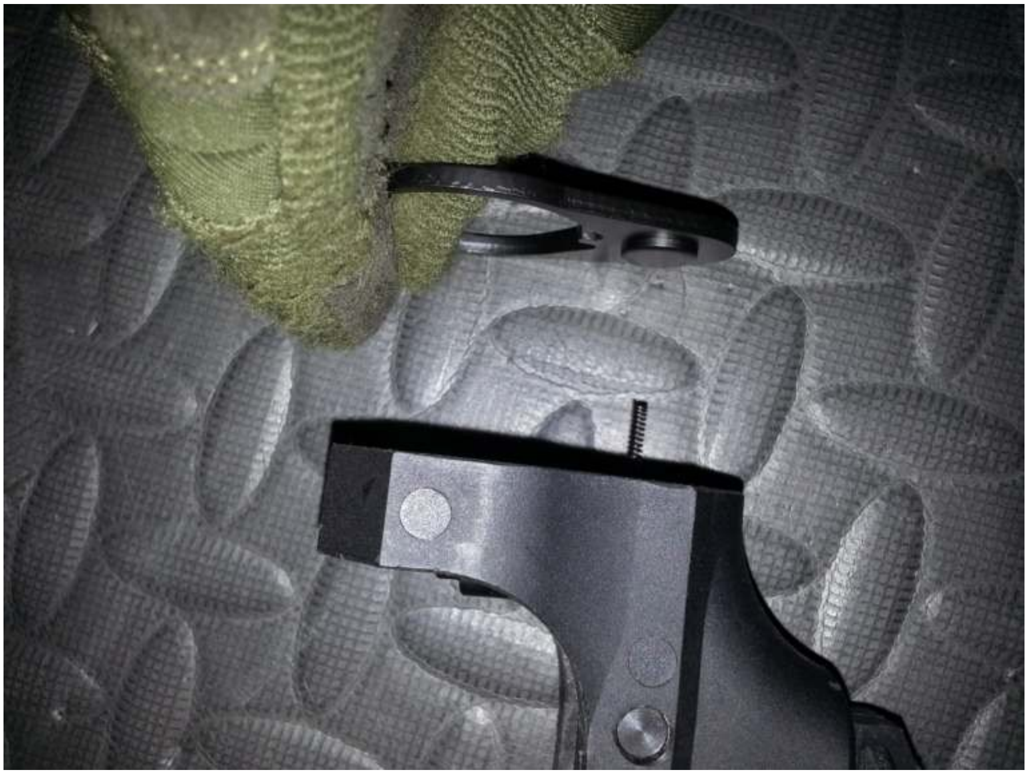




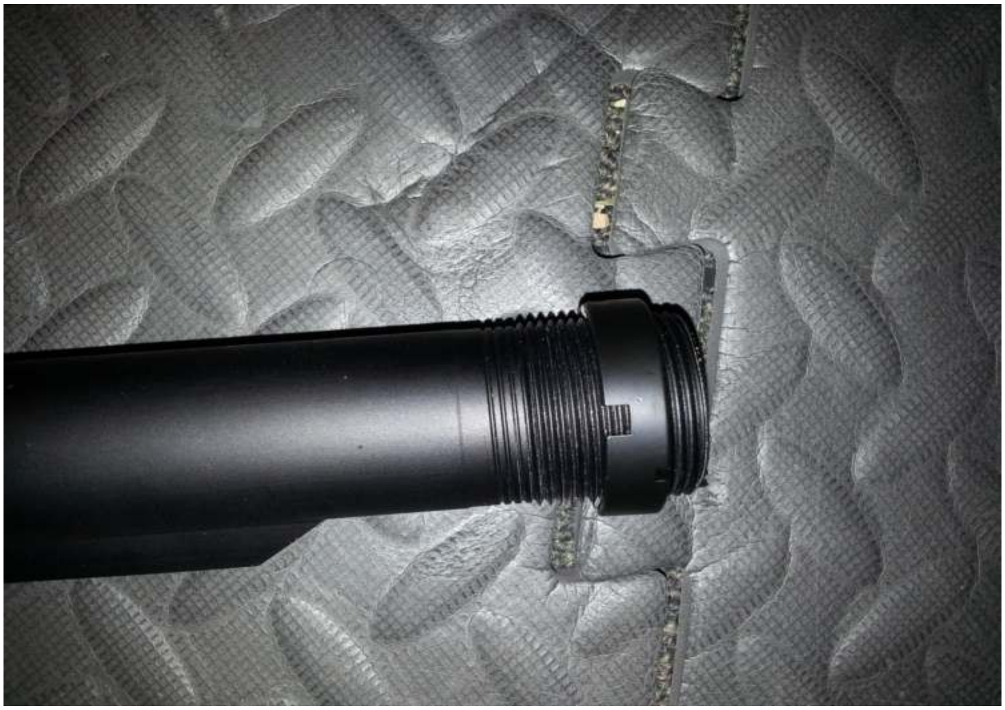
Put them in spring down and this is where things are gonna get a little bit tricky, so hopefully you have some patience.



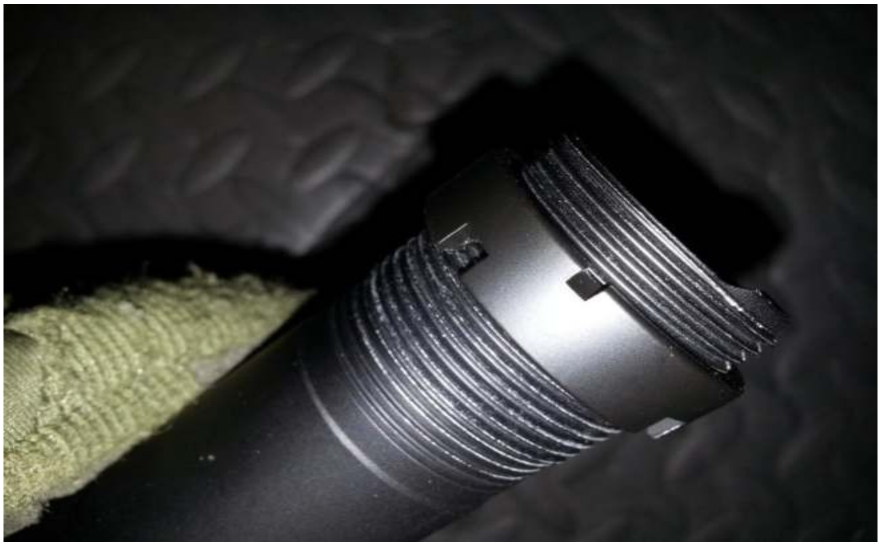
Get your end plate and position it with the protruding part towards the lower so it sits inside that little hole at the back to keep it from coming loose.



Get your buffer tube and castle nut, because they're gonna be installed, too.

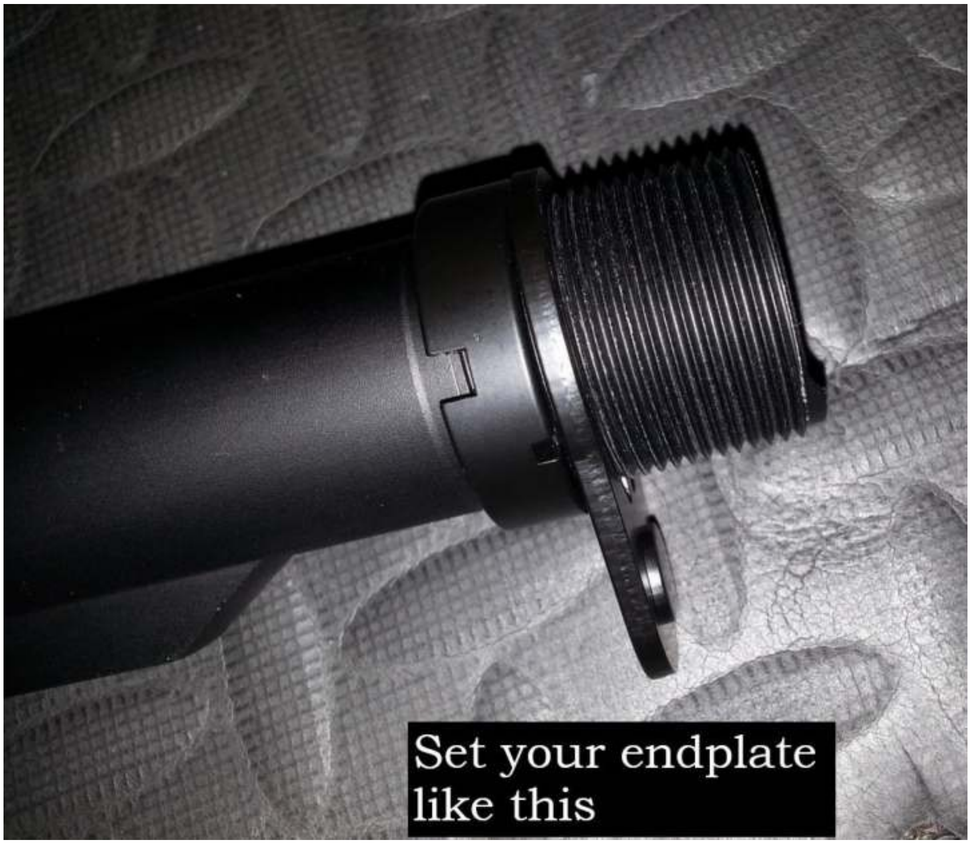


Start screwing your castle nut with the larger notches towards the back of the buffer, away from the lower receiver.



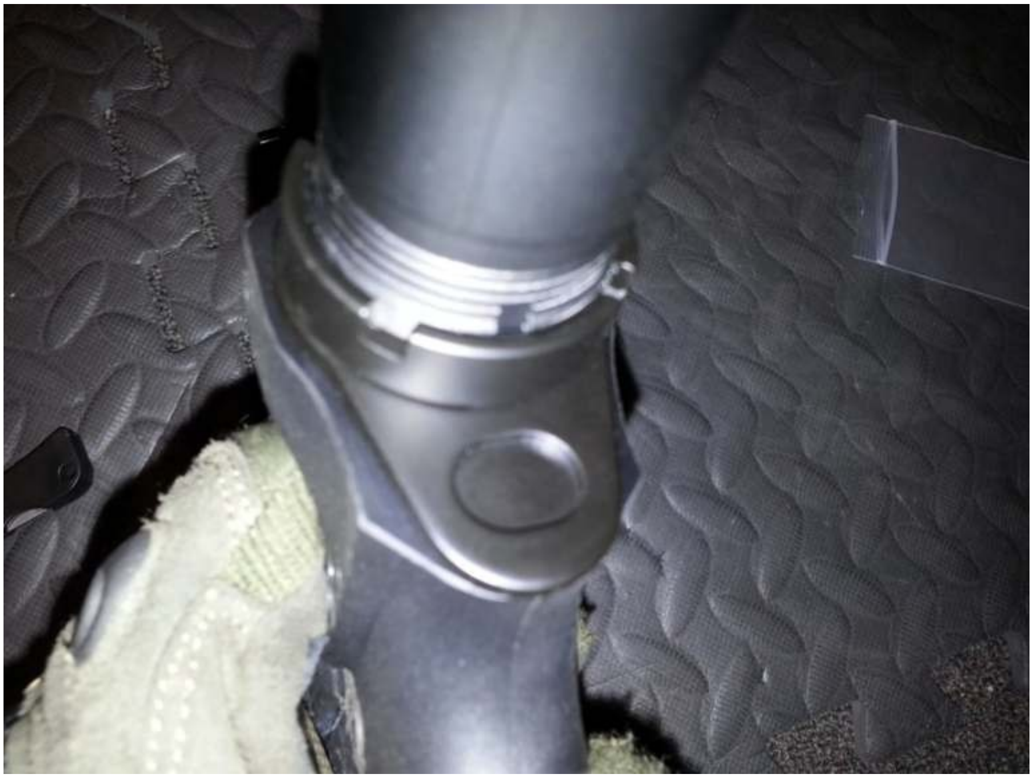
Here's a close up for help.

Screw the castle nut all the way to the end of the threading on the tube.



Try keeping your end plate from interfering with the takedown spring while screwing the buffer tube into place.

While still screwing the buffer on, make sure you don't go past the buffer retainer, and while putting the tube in place, you should make sure you apply pressure to the retainer with something, as it tends to try flying out if the buffer isn't holding it back enough, and it certainly won't be until after it's threaded.



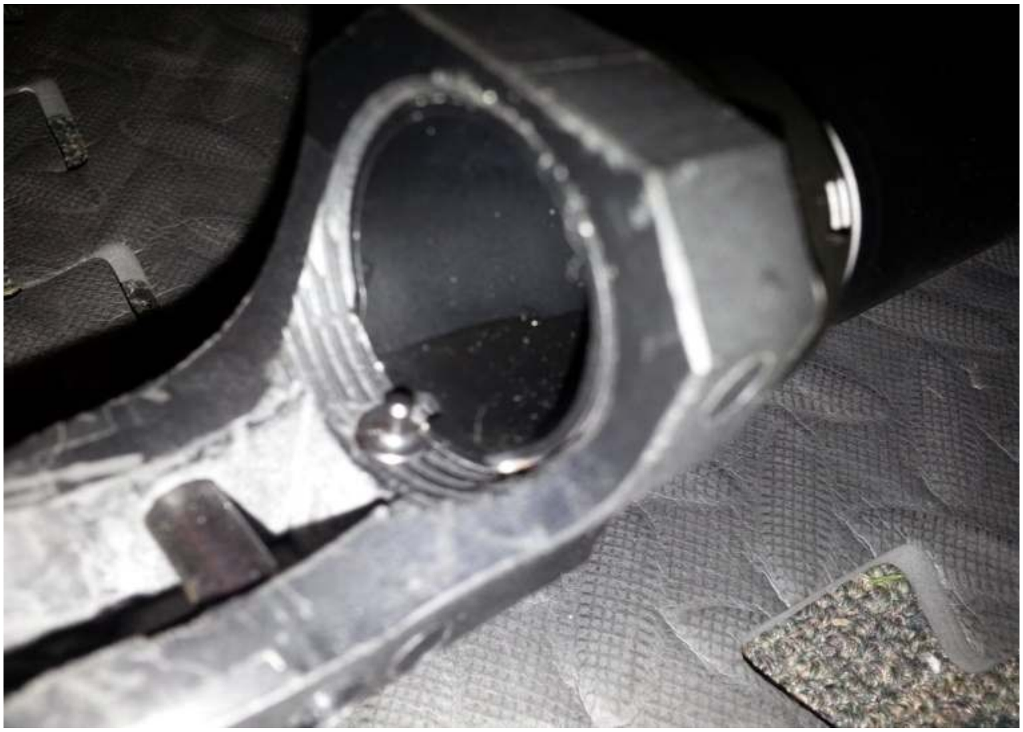
Going back to the rear, once your buffer can't go any further, move the end plate against the spring, making sure to keep it from bending outwards, and unscrew your castle nut up against the end plate, essentially locking it in place.

If your end plate has notches on it, you should "stake" the castle nut's smaller notches to align them with those on the end plate. Mine did not have any, so I have no need to demonstrate that.

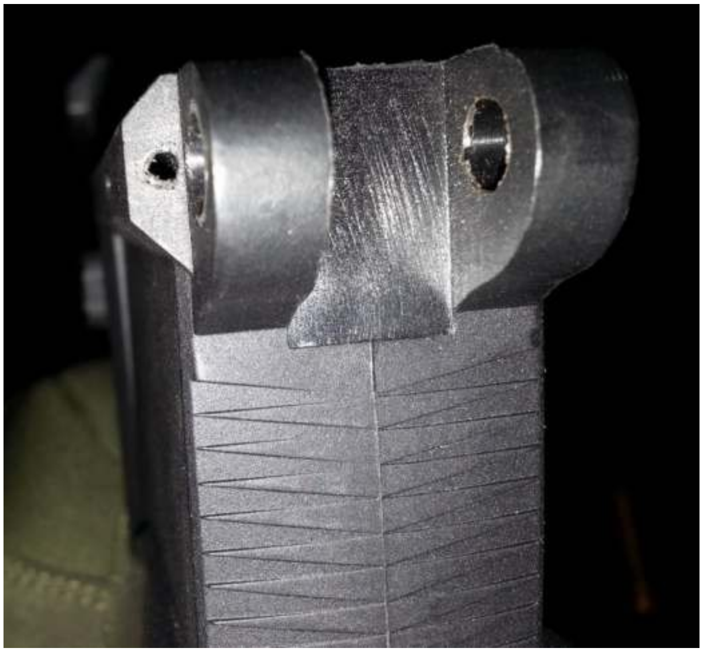
If you do, use the armorer's wrench or tap it with a punch.

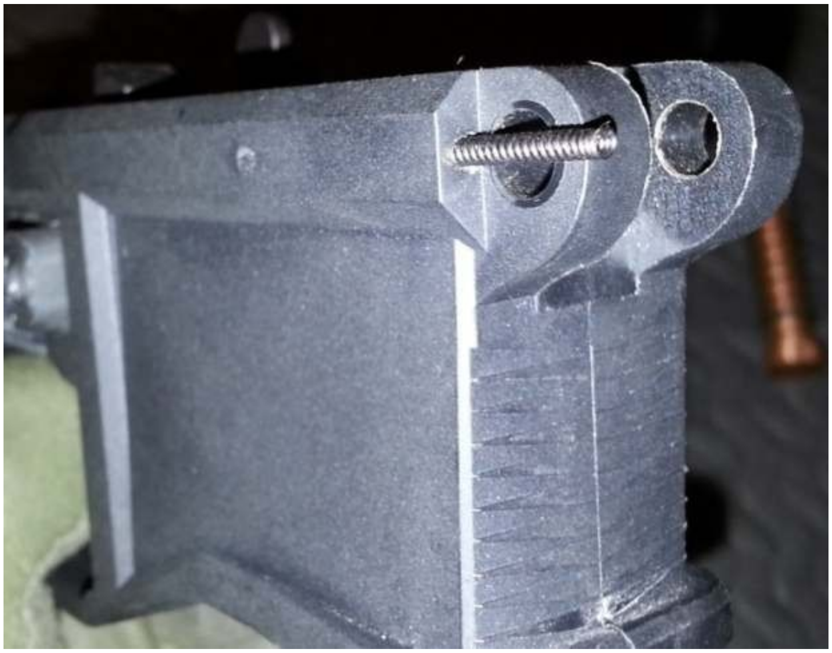
(If you want to additionally tighten your castle nut, according to Adiga Armory, a torque wrench with 25.6 ft-lbs is required. Do research prior.)

You should be able to install the rear takedown pin now.

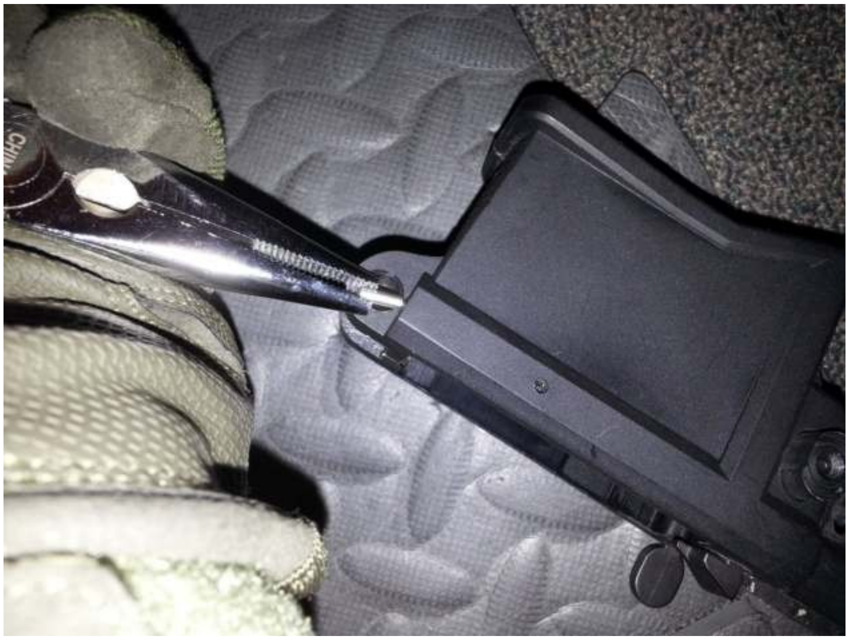


And at the front, we have the worst part of this, the pivot pin.





Start by inserting the spring first, then the detent.
The detent is where the real trouble is.



During this part, I found a little hack that really helped me out.

Pick the detent with pliers at a 90 degree angle and push it into the spring until you hear it “snap” at halfway in.

At that point, grab a punch and apply pressure on it, slowly letting go with the pliers and while still applying pressure, move the pivot pin in from its side, push it through the holes without letting the detent have a chance to fly out, and then twist the pin and you should hear the detent click into it

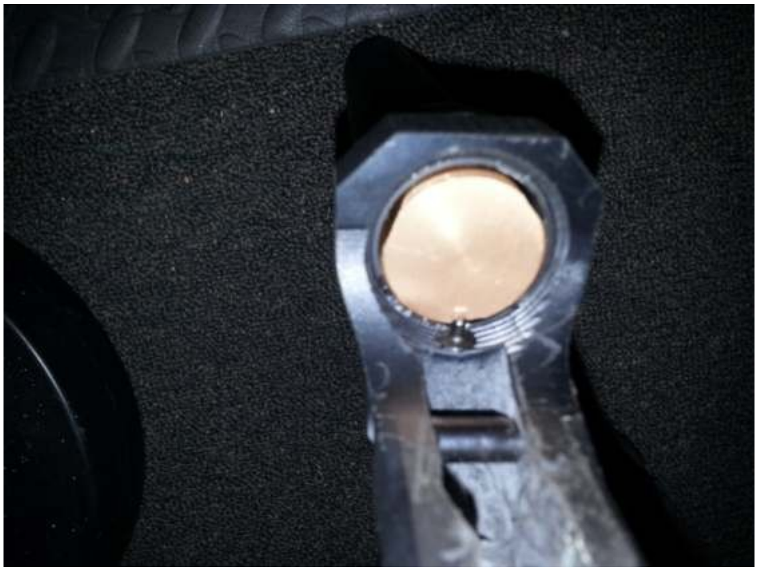
This is the punch I used, for reference.

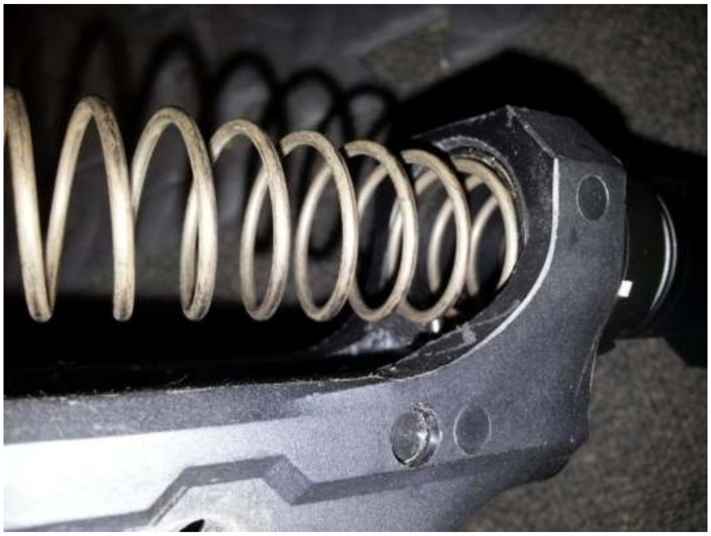
The other (being shown soon) was too small.

(3/32”)

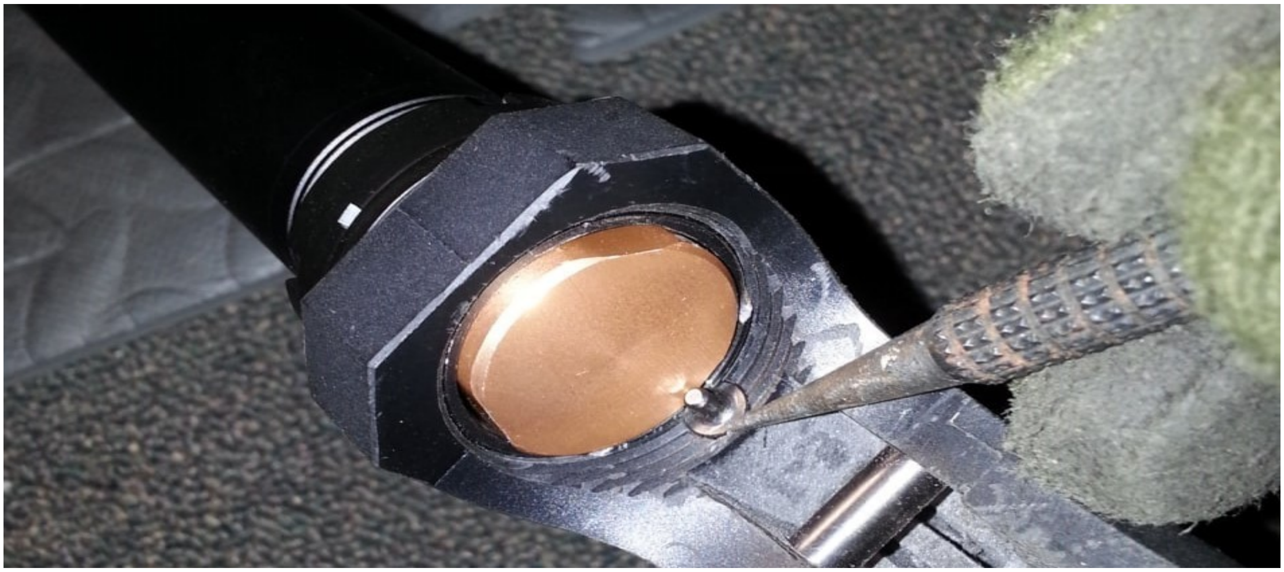
I would have taken photos to demonstrate the little "hack" but I only have two hands. Be careful when removing it to attach the upper.

Now to install the buffer and buffer spring, place the buffer in the spring and compress a segment of it along the buffer, push the buffer retainer down with something (like a punch) to provide more space to push it in with; Shove the spring in and you're done.



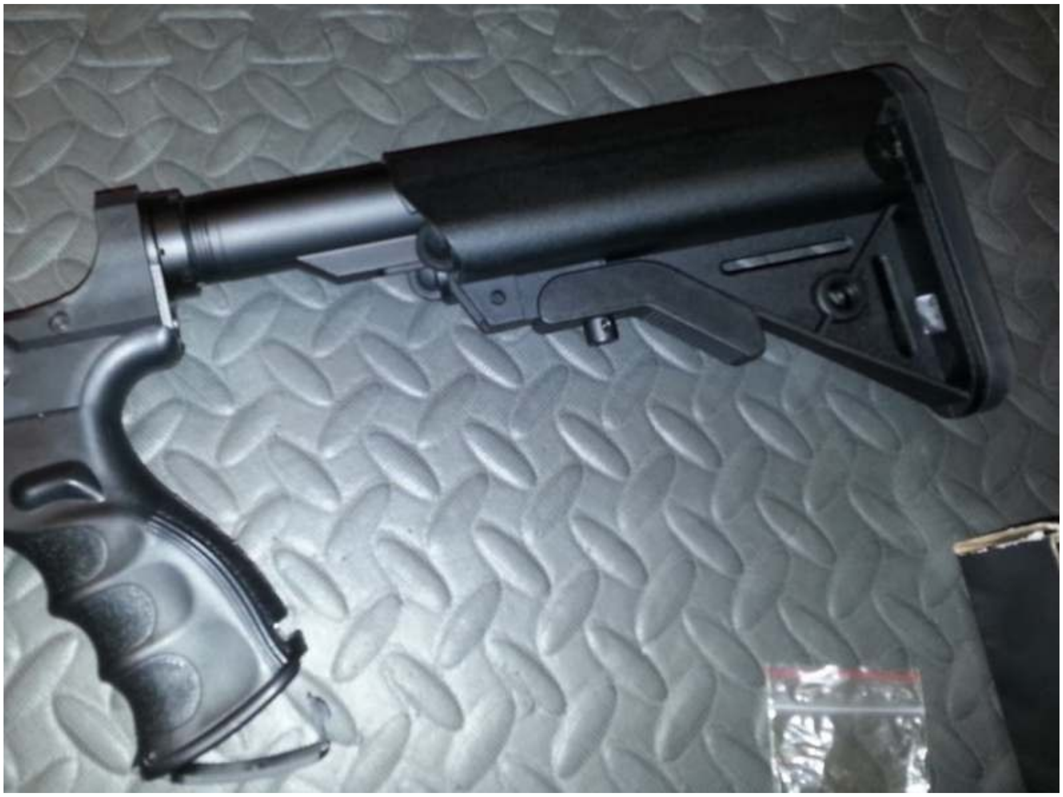


The end result should have both the buffer and spring behind the retainer.



(1/32”)

Here’s the punch I mentioned being too small for the detent, but well sized for pushing the retainer down.



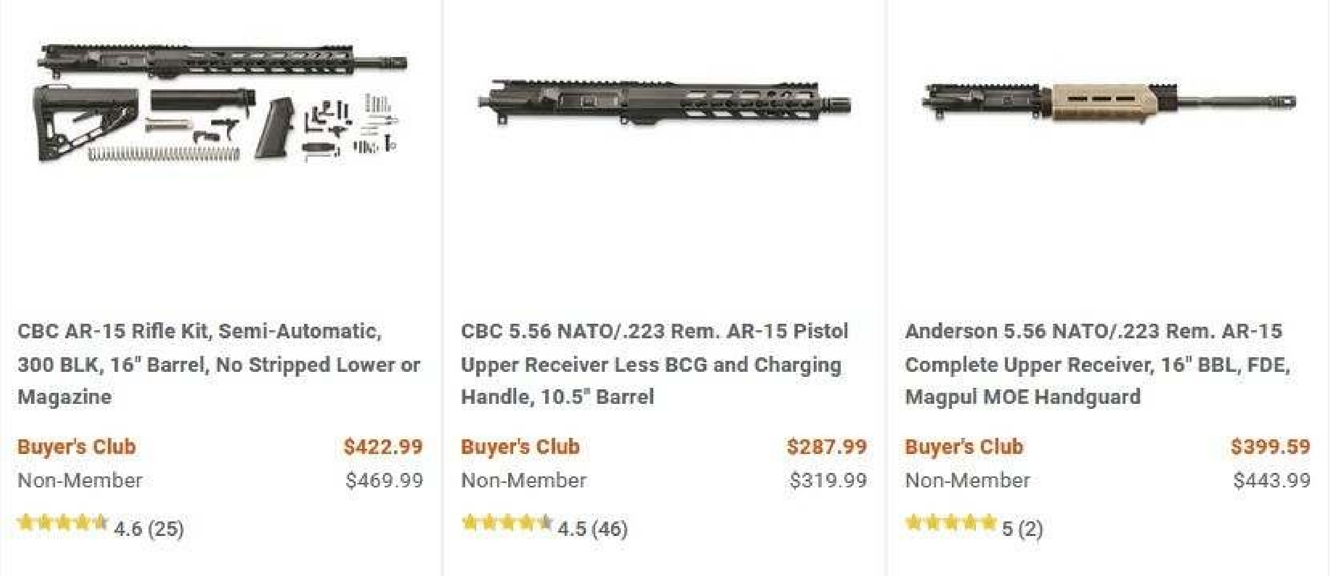
Installing your stock is gonna vary by just what design you're working with.

Mine is a sopmod style (I think the brand was Lakota Ops) and it functions the same as a B5 sopmod stock.

End result of this wasn't too bad.

UPPER RECEIVER ASSEMBLY

There won't be too many visuals on this since there aren't as many components to take into consideration, unless you're planning on building completely from scratch instead of buying parts kits, or even just buying a full upper assembly with all parts installed/included.



CBC AR-15 Rifle Kit, Semi-Automatic, 300 BLK, 16" Barrel, No Stripped Lower or Magazine

Buyer's Club $422.99

Non-Member $469.99

★★★★★ 4.6 (25)

CBC 5.56 NATO/.223 Rem. AR-15 Pistol Upper Receiver Less BCG and Charging Handle, 10.5" Barrel

Buyer's Club $287.99

Non-Member $319.99

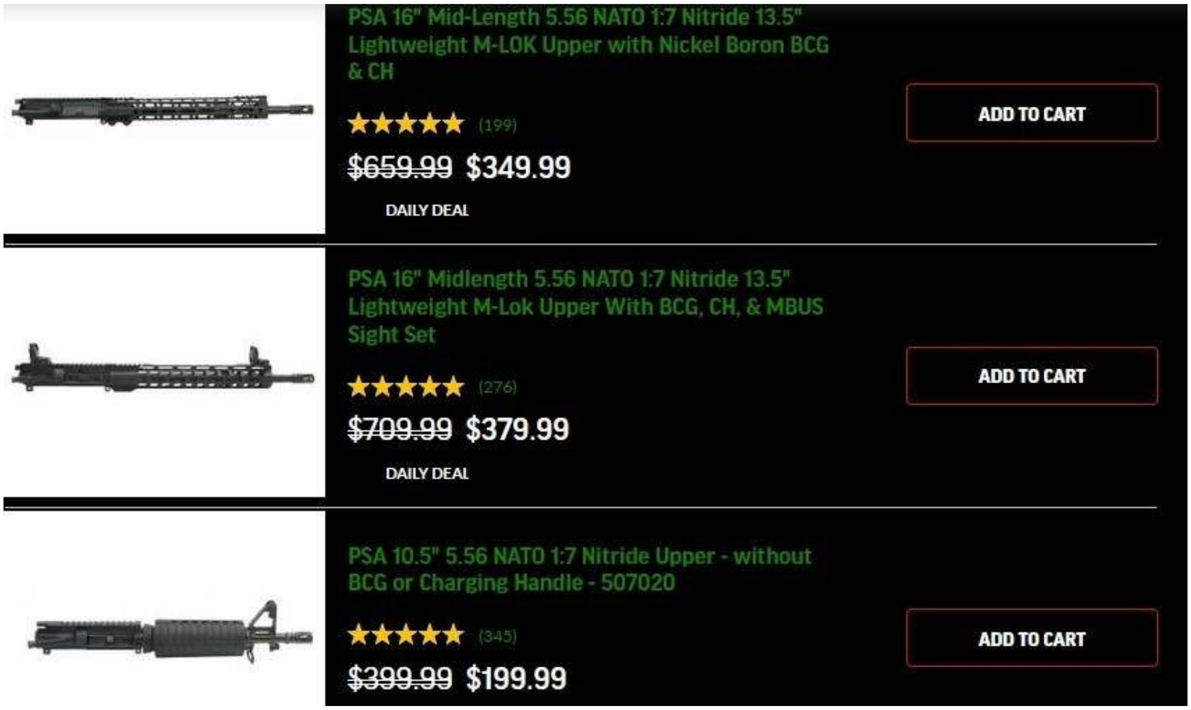
★★★★★ 4.5 (46)

Anderson 5.56 NATO/.223 Rem. AR-15 Complete Upper Receiver, 16" BBL, FDE, Magpul MOE Handguard

Buyer's Club $399.59

Non-Member $443.99

★★★★★ 5 (2)



PSA 16" Mid-Length 5.56 NATO 1:7 Nitride 13.5" Lightweight M-LOK Upper with Nickel Boron BCG & CH

★★★★★ (199)

~~$659.99~~ $349.99

DAILY DEAL

PSA 16" Midlength 5.56 NATO 1:7 Nitride 13.5" Lightweight M-Lok Upper With BCG, CH, & MBUS Sight Set

★★★★★ (276)

~~$709.99~~ $379.99

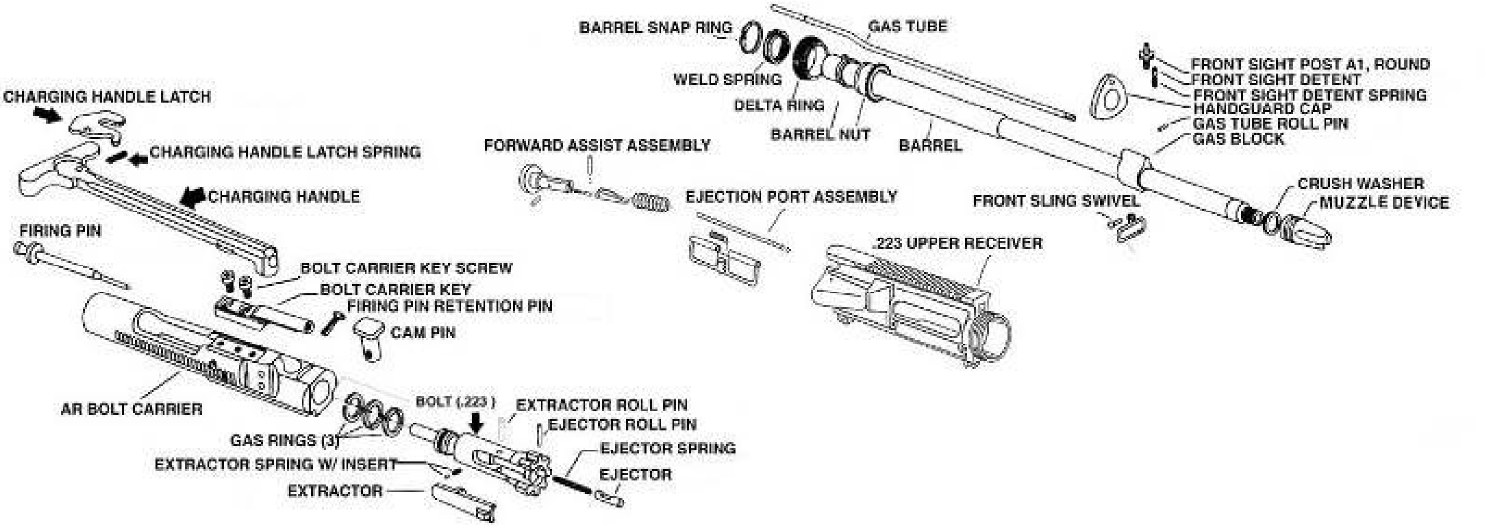
DAILY DEAL

PSA 10.5" 5.56 NATO 1:7 Nitride Upper - without BCG or Charging Handle - 507020

★★★★★ (345)

~~$399.99~~ $199.99

Of course the one downside with buying a complete upper is that they don’t always have just what we may be looking for, so some parts changing is expected, or just get all the individual pieces and build from there.



For anyone who has forgotten just what this portion of the rifle consists of.

Not all of this will be covered on account of how easy it is to get pre-assembled bolt carrier groups, forward assist, dust covers, etc.

This is just on putting the parts together.

Consider getting an upper receiver block for this.

Really helps when working with the barrel.

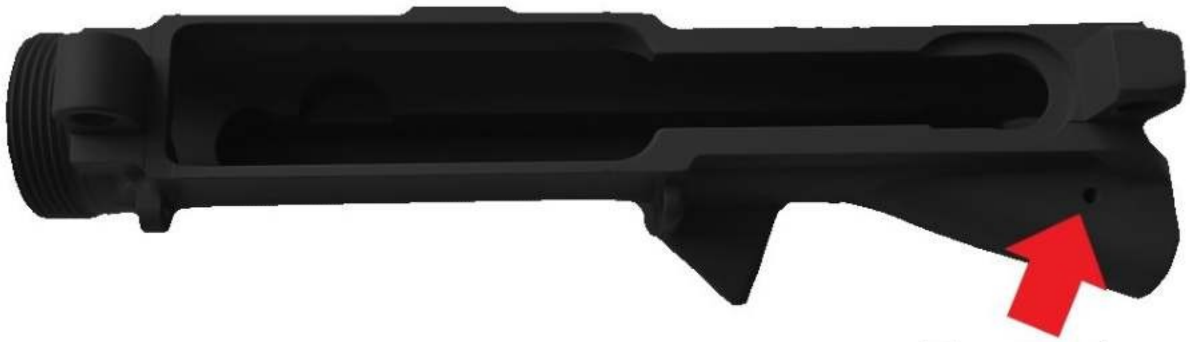
Assuming you got a stripped upper instead of one that either came with the forward assist already installed, or one that doesn’t accept one at all, we’ll start with putting these together first.

Forward Assist Assembly & Dust Cover

Forward assist plunger

Forward assist roll pin

Forward assist spring

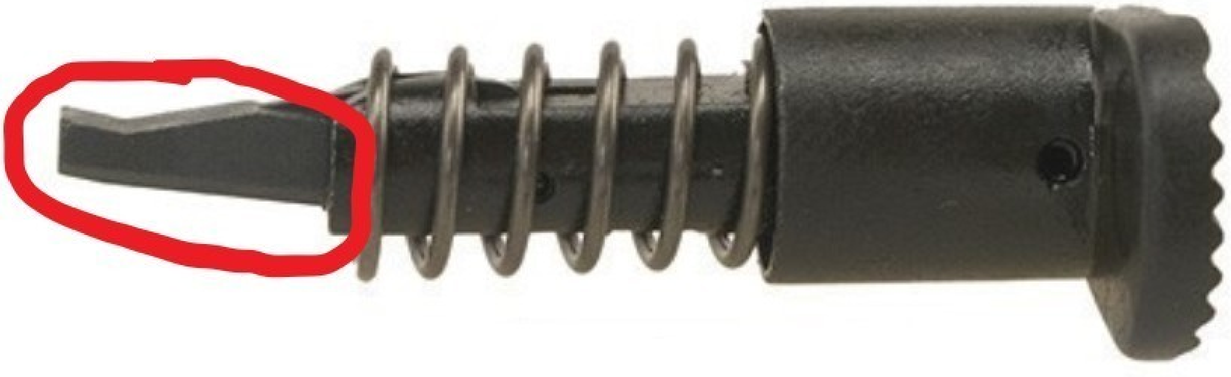


Forward assist roll pin goes in here

Insert the forward assist roll pin into the hole on the bottom side of the upper until it's able to stand on its own.

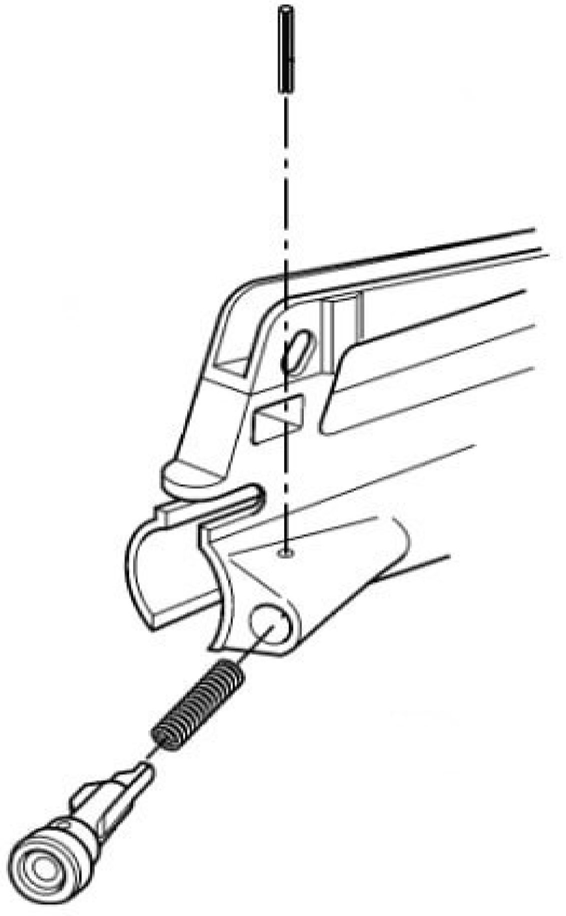
You can do this with a vise or the upper block with the upper right side up or upside down, just make sure if you use a vise that you have something like padded vise jaws to keep the finish from being scratched to hell.

Once you have the roll pin in enough, insert your forward assist, spring and all, with the pawl facing towards the inside of the upper.



For those of who who don’t know what a pawl is.

Just make sure this piece is facing the right way, like this:



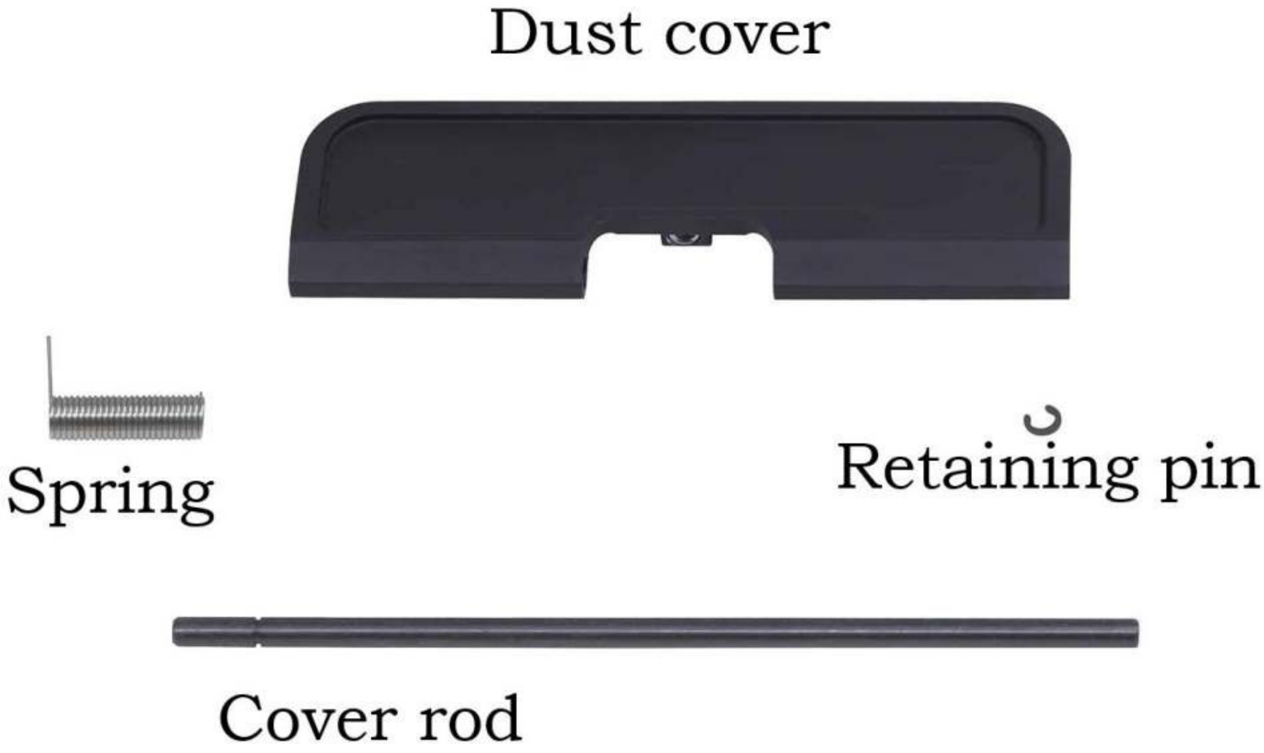
Insert the pin, only enough to keep it from needing additional support.

Put your forward assist and spring in, with the pawl facing as it is in the diagram to the right.

Apply pressure on the forward assist as you start tapping the roll pin in until it’s flush with the upper. (A 3/32” roll pin punch is suggested for this.)

Once the forward assist is secure in place, test it to see if it moves in and out freely while compressed.

Moving to the dust cover/ejection port.

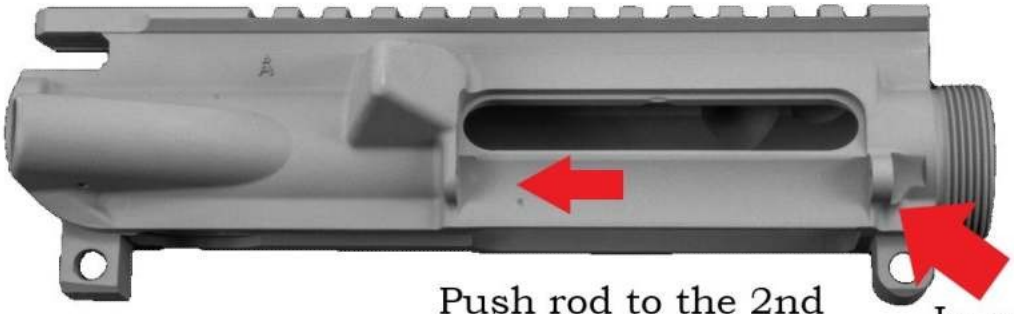


As a reminder of just what this includes.

If your rod comes with the pin (or snap ring as some call it), you don’t need to put the little bugger on. But if you do, put it in the notch on the rod and lightly hammer it and don’t go off center or it could fly off.

Lay your upper on its side and slide your rod in, making sure the side without the snap ring goes in first, until it can sit on its own in the first hole. Don’t put the rod in both holes yet.

(I think some also opt to install it where they apply the snap ring after the rod has been inserted.)

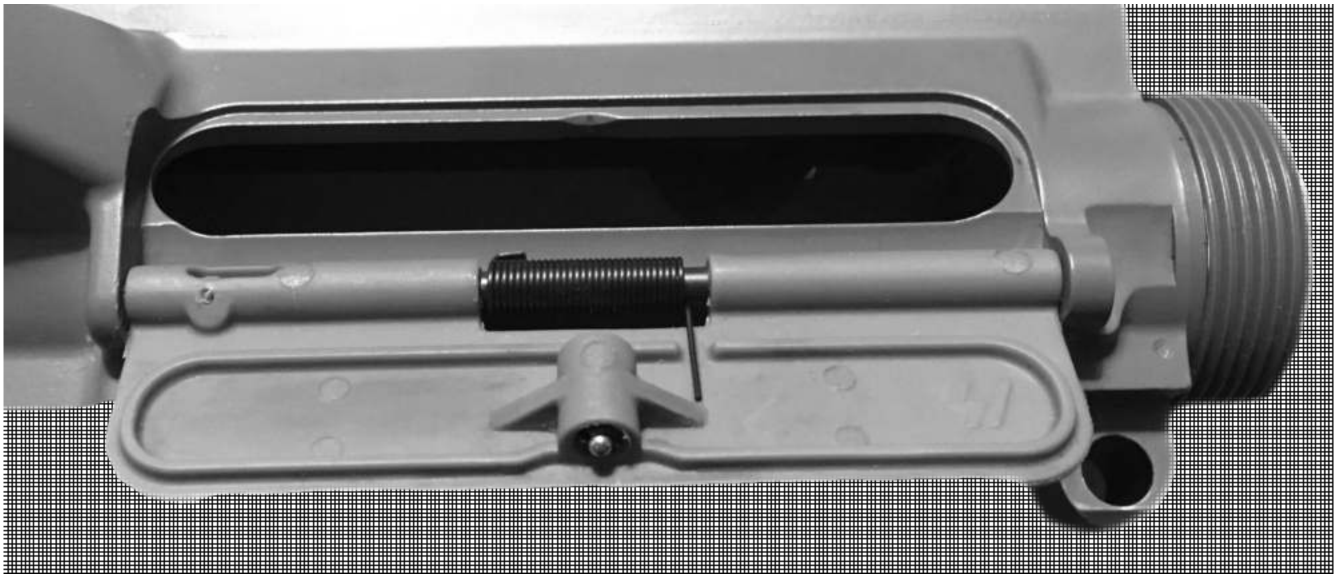


Push rod to the 2nd hole once the cover and spring are in place

Insert rod from here

Keep the rod within the first hole, get the dust cover in the open position and move the rod through the first tunnel of the dust cover, stopping before you go past it.

Ensuring the long side of the spring is towards the barrel, coil it until the long end faces towards the dust cover while it's in the open position so it applies pressure to the dust cover (you can twist it by hand or use pliers if needed), push the rod all the way through.

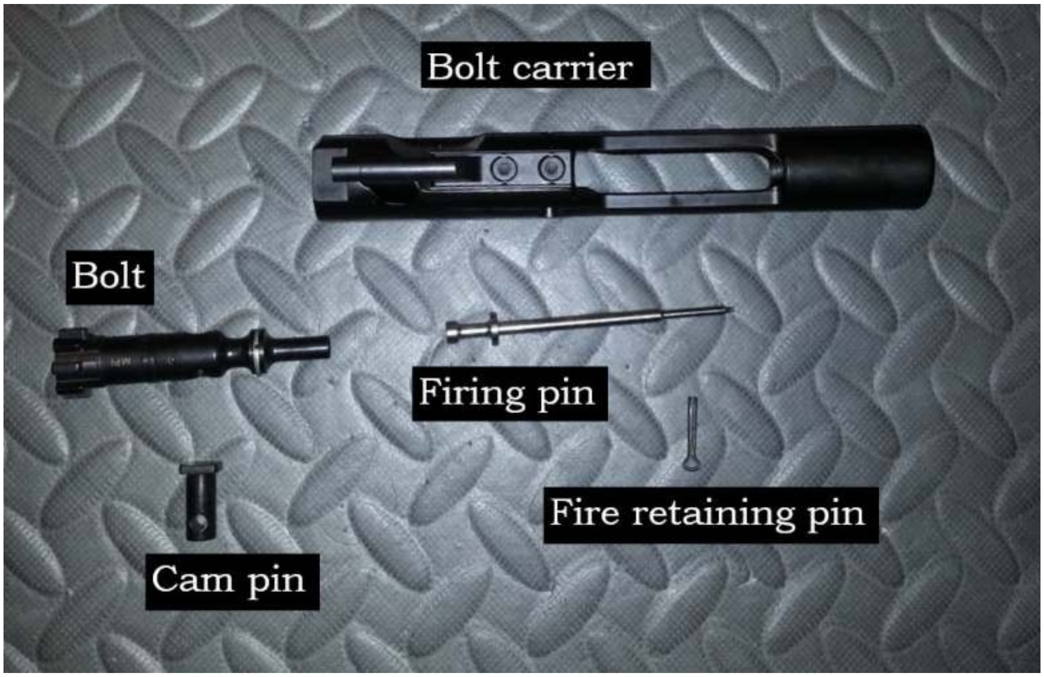


Regardless of how you install it, this should be how your final result looks.

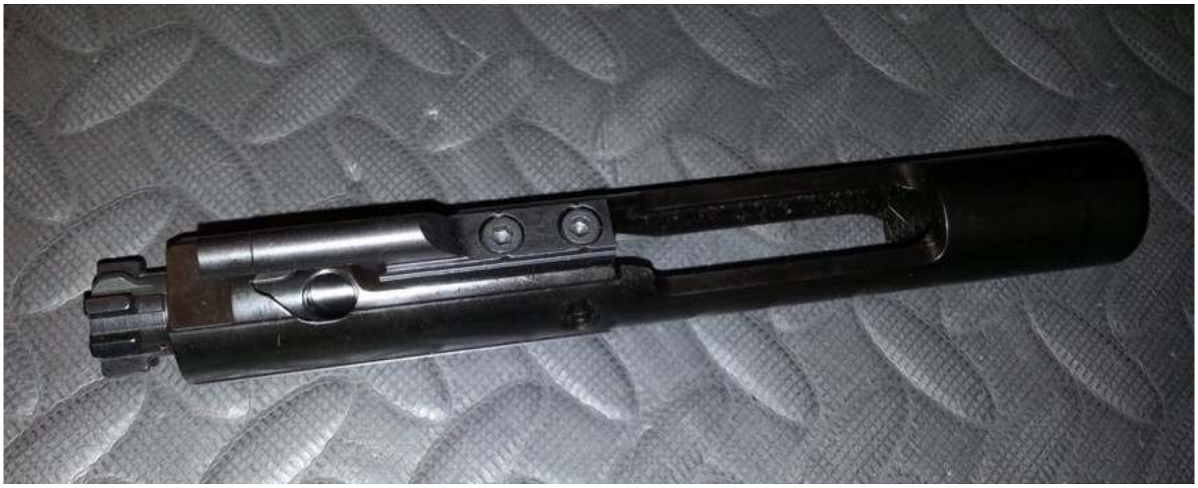
Press the cover in against the upper and it should snap shut.

Push it out and it should snap open.

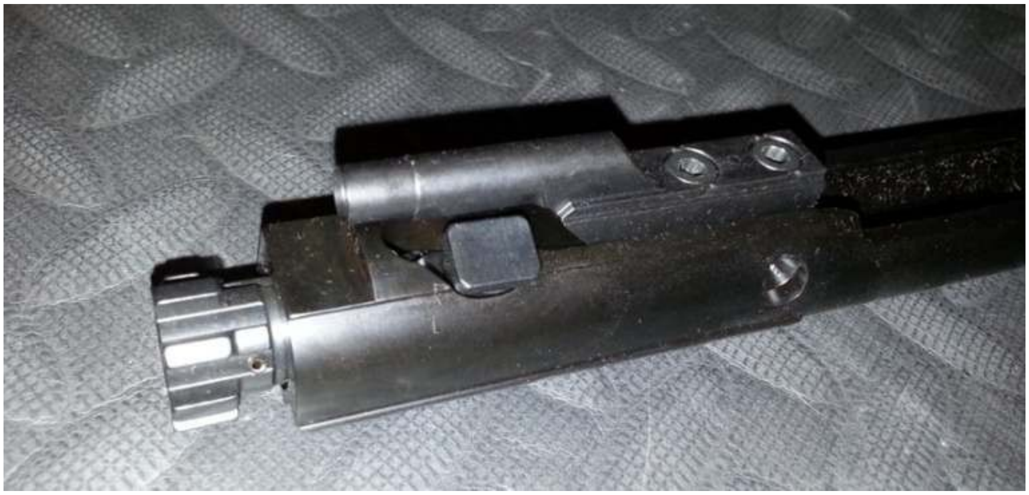
Bolt Carrier Group



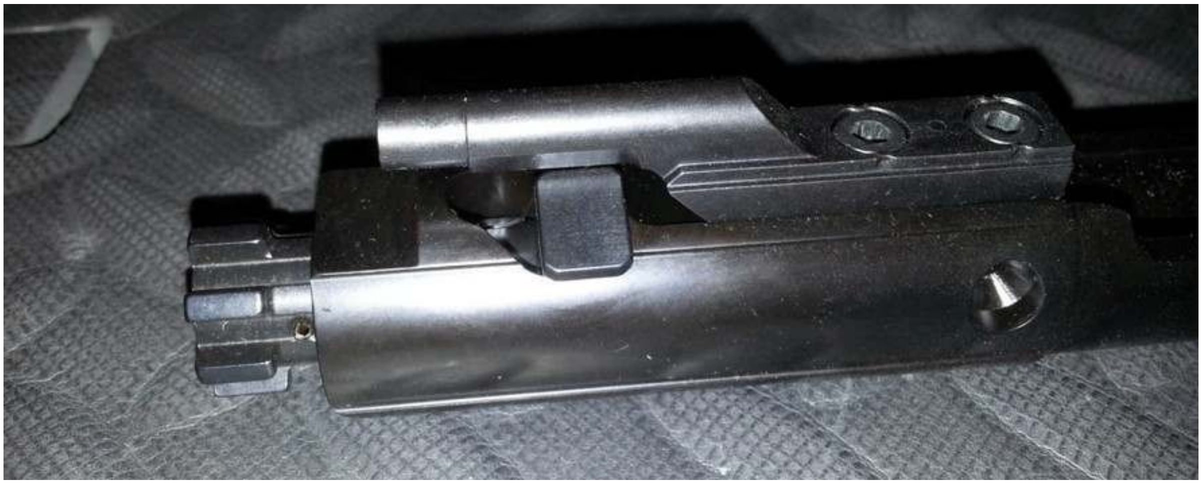
Assuming you either want to take apart your bolt carrier group and put it back together, or got all the main parts separately, here's a brief demonstration of assembling the main pieces.



Firstly, insert the bolt into the rear of the bolt carrier.



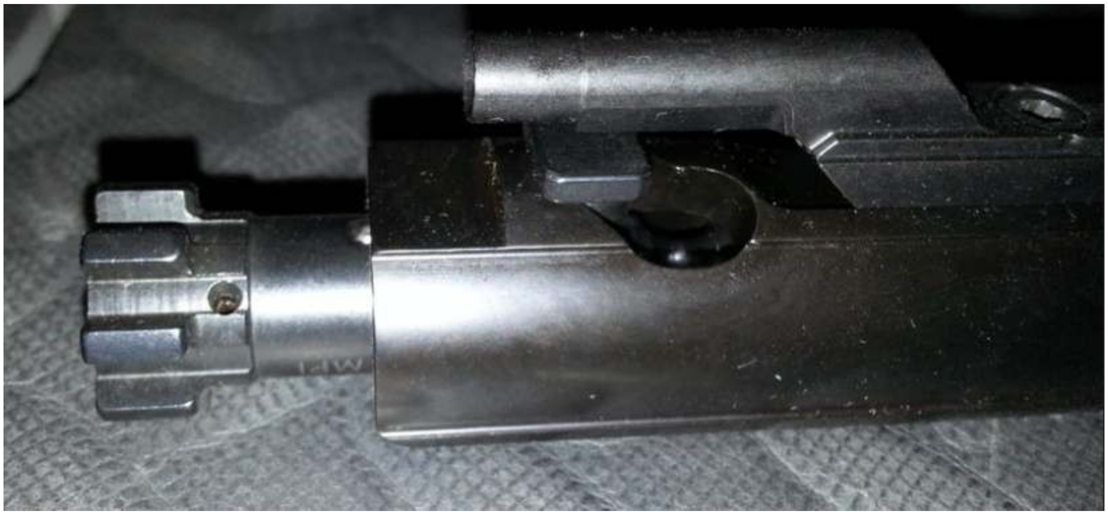
Then insert the cam pin in through the opening to the lower side of the gas key, making it go in horizontally and then twisting it vertically.



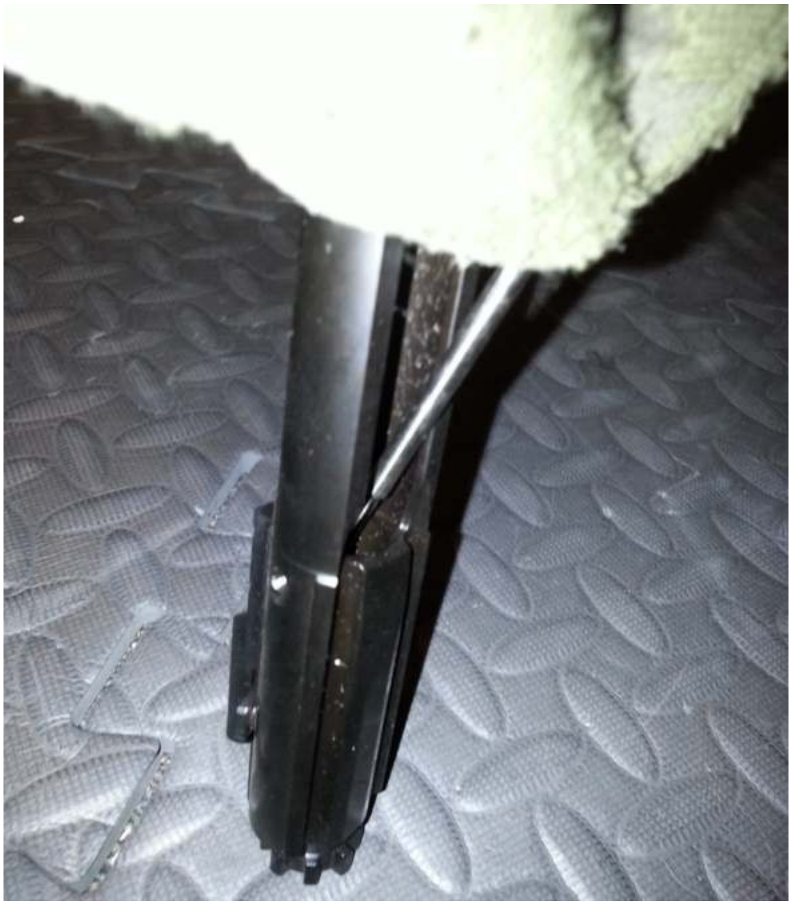
To make sure it works, just pull the bolt back and see if it comes out.
If not, it should be secure. Just pull it backwards, don't try twisting it.

If the cam pin doesn't want to go in the hole you have sticking outwards, pull the bolt out and switch to the other side.

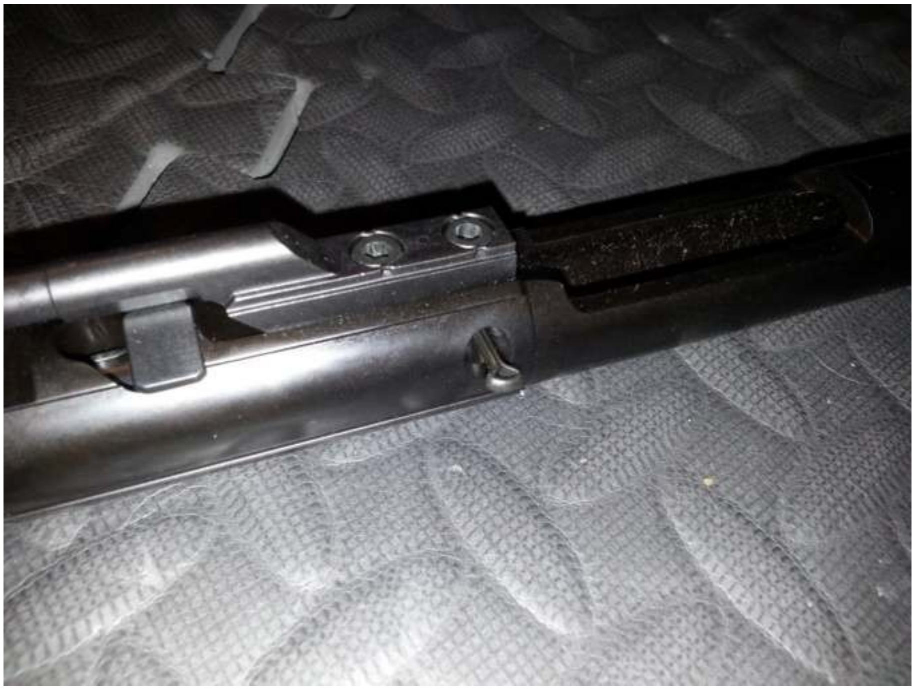
The cam pin only fits through one of them, the other is to secure it once it's in.



Now drop the firing pin in from the front side of the bolt carrier, with the pointed side going inwards.



With the firing pin in place, insert the retaining pin at the side of the bolt carrier.



You should be able to press it in place with your finger.

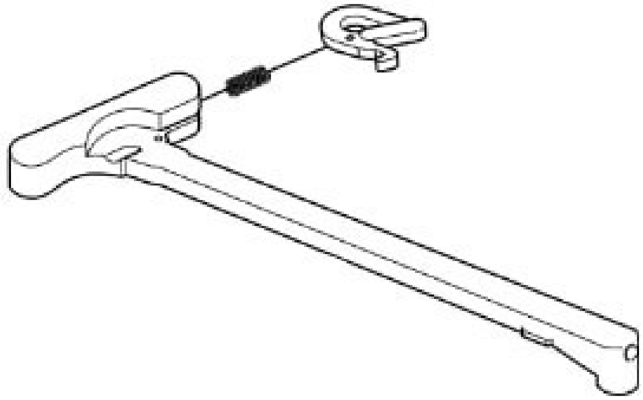
If the retaining pin is secured, try easily pulling the firing pin or tilting the front side of the bolt carrier downwards and if the pin only drops a small amount, but doesn't fully come out, it's good to go.

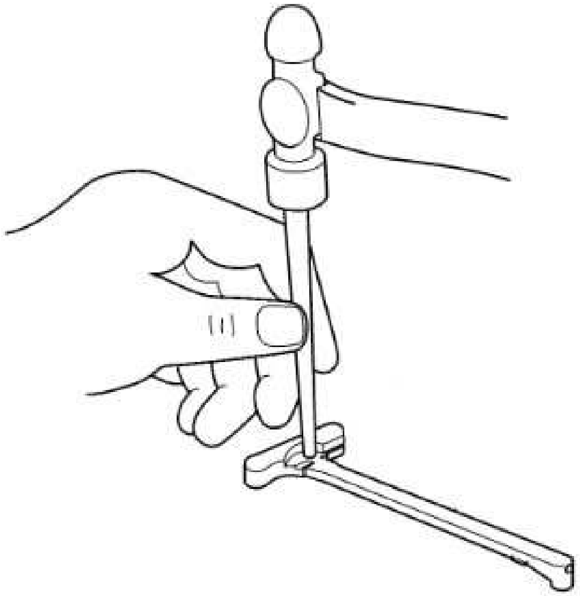
If you want to remove the ejector from the bolt section of the BCG, you can insert the tip of the firing pin to start pushing the pin out, and then push the rest out with the fire retaining pin.

It is very interesting to see how this weapon also doubles as its own tooling in some instances.

Charging Handle Assembly

Insert your charging handle latch spring into the side of the charging handle, followed by tapping the charging handle roll pin enough to stand on its own.





Bring in the latch, and while it is compressed, begin tapping the roll pin into place once everything seems aligned.

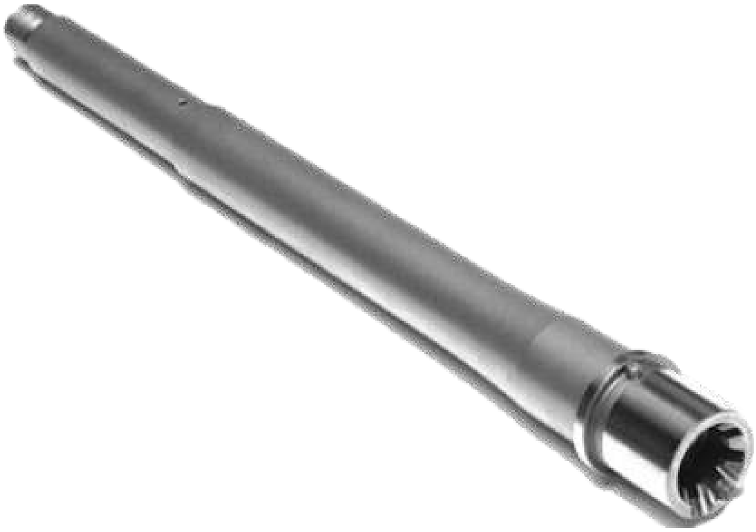
Barrels & Handguards

With all that done, we move onto the barrel and then installation.

The vice block works real wonders here.

Put your upper in the vice block before continuing.

(Do not alternatively have a friend hold the parts in place while you try attaching them unless you're eager for an injury.)

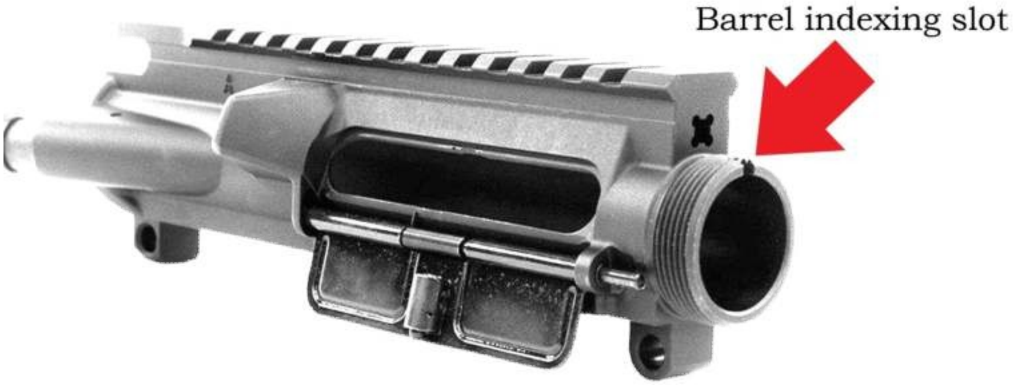


Before installing the barrel, it is suggested to lightly grease around the barrel extension.

(That's the part sticking out towards the right in this image. It's where your rounds will be chambered.)

The grease should be anti-seize and contain no graphite to avoid galvanic corrosion. (Keep your upper in a vise; If you try having a friend hold onto it while you apply torque, that's an injury waiting to happen.)

Align the barrel indexing pin (little piece sticking upwards in the same image) fits into the indexing slot on the upper receiver.



Things get a bit vague when it comes to what to do next, as it partially depends on just what kind of handguard you plan on installing.

Drop ins seem to rely on delta rings, whereas free float options have barrel nuts, some of which are proprietary and specific to certain brands.

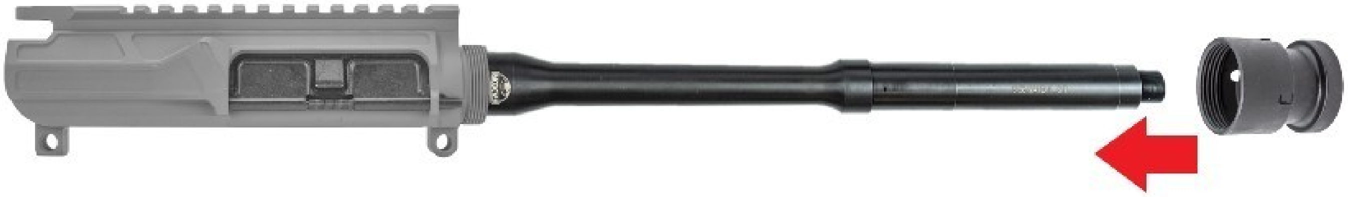
So I'm just going to demonstrate the process of installing a BCM free float quad rail.

With that stated, there are plenty of resources for installing a drop in rail and that's often said to be easier anyway, so here we go.

(Upper better still be in that vise.)

After greasing the barrel extension, and the upper receiver threads if you'd like, take the barrel nut and hand screw it onto the upper, with its threads facing towards the upper receiver.

Screw it slowly to avoid cross threading.

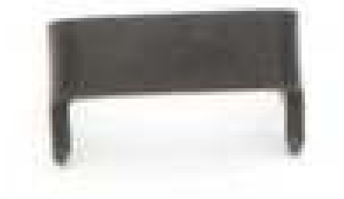


With your barrel and upper greased, slide the barrel nut over the barrel and screw the threads in by hand

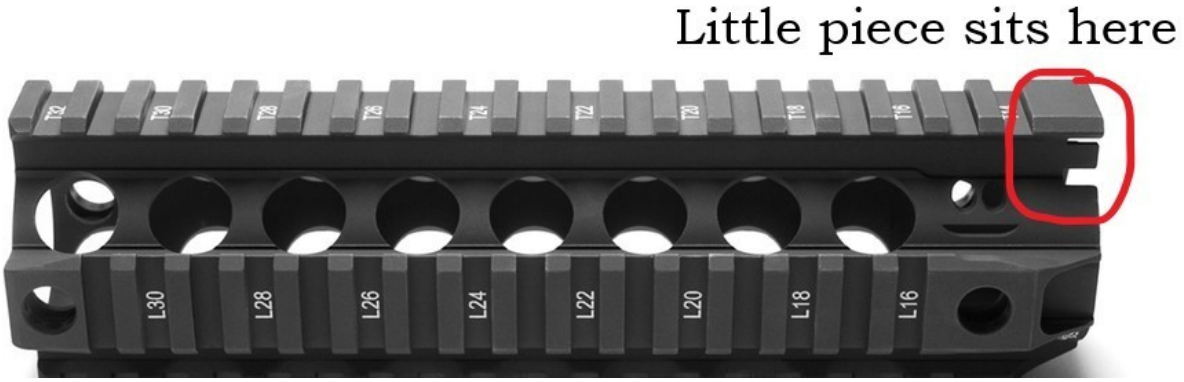
Tighten the barrel nut using a barrel nut wrench on a torque wrench or an armorer’s wrench.
I often see people cite a ½” torque wrench specifically, and apply between 30-80 ft-lbs of pressure. (You may need to press in towards the upper while using the wrench.)

Some say to remove the barrel nut and do the process again around three or four times to “break in” the threads.

(Some tend to file the threads a bit due to burrs that will form over how tight the KMR barrel nut is.)

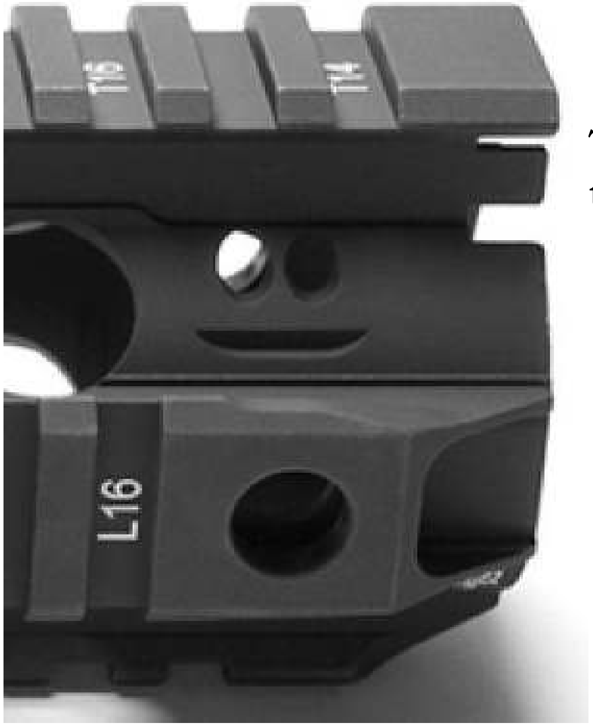


Next comes placing this little piece on back of the rail that sits in front of the upper.



You should be able to install your gas block and tube prior to putting sliding the handguard on as long as it’s a low profile block. If it’s an A2 front sight block, try installing that as you’re sliding the handguard towards the upper. (Line your gas tube towards the ‘X’ cut in the upper, if you’re wondering where that’s supposed to go.)

Some say a heat gun (or hairdryer) can assist in placing the handguard.



There are these little divets for inserting the included screws as well.

These cutouts are where you'll seat the screw housing.

Be sure to degrease them prior to screwing them in place and add a little loctite or equivalent prior to as well. (Which BCM supplies in the kit.)

And take note that one screw is rounded, the other has notches around it.

The notched one should be installed first so the shaft of the rounded one can rest into a notch when it's in place.

If you have difficulty when installing this, consider tapping a bit from the front with a nylon hammer.

Always check the specific instructions with whatever handguard system you may opt to run, because they may install in the same method (depending on design) but they do not all come with the same parts to do so. Either buy a kit for it, or order the barrel nut to spec with your free float handguard from the manufacturer.

Delta ring assembly for drop-in, specified barrel nut for free float, unless your manufacturer states otherwise.

Muzzle Device

Assuming your barrel is threaded, we can get onto installing the muzzle device.

Usually your muzzle device should include the additional parts required to install it, so this is also gonna be a brief overview on account of different mounting methods.

As far as I know, there are four options for mounting hardware when it comes to installing muzzle devices and those consist of the classic crush washers, locking nuts and peel washers.

Crush washers must be replaced whenever they are removed from the barrel, as they literally work to be 'crushed' once tightened and may not function the same after they are removed from the barrel's muzzle.

Peel washers "peel" in layers by heat to assist in alignment of a muzzle device, may work better with specific muzzle devices.

Locking nuts act like two nuts which face in opposite directions once the muzzle device tightens over it, causing a lock effect.

And the fourth is nothing at all.
Can't say I've known anyone who's suggest that option.

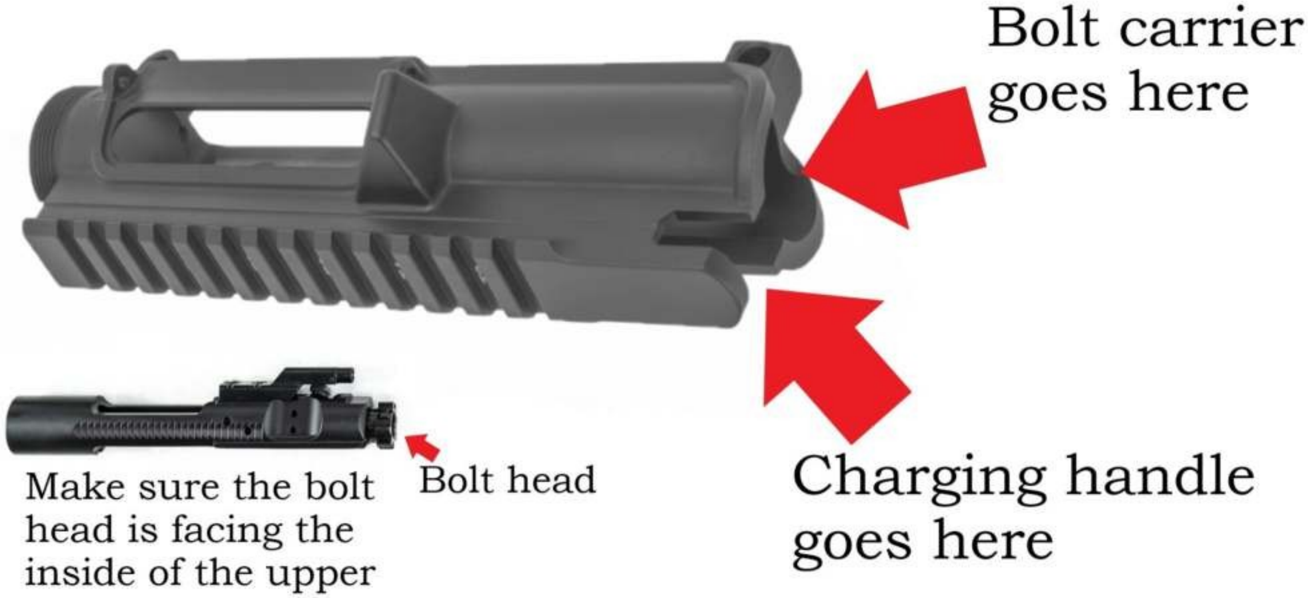
The recommended torque required for a muzzle device, according to ITS Tactical, is around 15-20 ft-lbs, unless otherwise specified by manufacturer.

If you're using a crush washer, keep the smaller end of it towards the barrel and the larger side towards the muzzle device.

So it's as simple as slide washer/nut onto the threading, screw your muzzle device in place and then apply torque while your upper is in a vise.

Final Assembly

For the final stretch, you can just hold the upper receiver upside down, pick up the bolt carrier group and charging handle, bolt carrier gas key in the slot of the shaft of the charging handle and insert them both into the upper receiver.


Bolt carrier goes here
Charging handle goes here
Bolt head
Make sure the bolt head is facing the inside of the upper

MAINTENANCE SUGGESTIONS

To keep your rifle in the best condition you can, it helps to clean it after every range session you can, even if that only means you'll be able to tend to the bolt carrier and the bore.

You can consider soaking your smaller parts in some clp overnight prior to planned use to keep you from having to deal with the hard to clean spots like you normally would.

Try taking notes of how many rounds you fire before each time you clean it.
I believe some often do a routine cleaning after 500 or so.

An overlooked suggestion is keeping spares of small parts and thankfully certain suppliers can sell you them in bulk for under $20, depending on the part(s).

When it comes to lubricating your bolt carrier group, don't overdo it since more lube will just become a magnet for attracting debris and dust.

Never lubricate the bolt face.

Consider applying a little lube to the back of the hammer to ease wear when it strikes.

Degrease and lubricate your buffer spring.

You can find an unlimited amount of advice on general cleaning instructions, so these are just some suggestions to try incorporating into your cleaning routines.

TROUBLE-SHOOTING

“If your rifle misfires with a live round in the chamber of a hot barrel, immediately remove the round keeping the barrel pointed in a safe direction. If you are unable to remove the live round, wait 10 seconds, remove the magazine keeping barrel pointed in a safe direction and wait 15 minutes for the barrel to cool. After cooling, try to remove the round. Continuous or rapid firing of your rifle can cause the barrel temperature to reach a “COOK-OFF POINT” where the heat of the barrel can cause a live round to fire within 10 seconds of contact with a hot a chamber. Always keep your face away from the ejection port when clearing a hot chamber.”

“If your bolt fails to unlock and you try to free it by banging the buttstock on the ground or mortaring it, keep clear of the muzzle in case of an accidental discharge.”

“Never fire your rifle with water in the barrel as this could cause the rifle to explode.”

"If you experience a noticeable difference in sound or recoil when firing, STOP FIRING! The cause for either condition could be incomplete powder burn or a bullet stuck in the bore. Immediately clear the rifle and check for unburned powder residue in the bore and the receiver or for a bullet stuck in the bore. Remove the unburned powder before you resume firing. If a bullet is stuck in the bore, have a qualified gunsmith take care of the issue. FIRING WITH UNBURNED POWDER IN THE BARREL COULD CAUSE THE BARREL TO EXPLODE.”

Problem	Check For	What to do
Won't Extract	Froze extractor.	Remove and clean.
	Restricted buffer assembly.	Remove and clean.
	Restricted movement of bolt carrier group.	Remove, clean, and lube. Make sure gas tube fits into carrier key and that the carrier moves freely before replacing.
Short Recoil	Correct alignment of gaps in bolt rings.	"Gaps" in the gas rings should be staggered 120 around the bolt body for maximum effectiveness.
	Carbon or dirt in carrier key, or on outside of gas tube.	Clean carrier key, or around area of gas tube.
	Q-tip or pipe cleaner pieces stuck inside carrier key.	Clean out if possible or have rifle checked by a qualified gunsmith.
Bolt Fails to Lock After Last Round	Dirty or corroded bolt latch.	Clean out if possible or have rifle checked by a qualified gunsmith.
	Faulty magazine.	Replace.
Selector Lever Binds	Needs oil.	Lubricate with oil.
	Dirt or sand under trigger.	Clean.
Bolt Carrier "Hung Up"	Round jammed between bolt and charging handle and/or double feed. **Warning: Keep clear of muzzle.** Caution: **After round is removed, bolt is under tension.**	1. Remove magazine. 2. Point muzzle in safe direction. Engage safety if possible by pushing out takedown pin and manually cocking hammer. Close receivers. 3. While pulling down on the charging handle, bang the rifle butt on the ground. Round should eject.

Problem	Check For	What to do
Won't Fire	Selector lever on **"SAFE"**.	Put it on **"FIRE"**.
	Improper assembly of firing pin.	Assemble correctly. Retaining pin goes in back of large shoulder on firing pin.
	Too much oil in firing pin recess.	Wipe out with pipe cleaner.
	Defective ammunition.	Remove and discard.
	Too much carbon on firing pin or in firing pin recess.	Clean.
Bolt Won't Unlock	Dirty or burred bolt.	Clean or see a qualified gunsmith.
Won't Extract	Broken extractor spring.	See a qualified gunsmith.
	Carbon in chamber.	Clean chamber.
	Fouling or carbon in extractor recess or lip.	Clean extractor.
Won't Feed	Dirty or corroded ammo.	Clean.
	Dirty magazine.	Clean.
	Defective magazine.	Replace.
	Too many rounds in magazine.	Take out excess.
	Action of buffer assembly is restricted.	Take out buffer and spring and clean them.
	Magazine not fully seated.	Adjust magazine catch. Press magazine catch button on right or left side.
Double Feed	Defective magazine.	Replace.
Won't Chamber	Dirty or corroded ammo.	Clean.
	Damaged ammo.	Replace.
	Carbon in chamber or on gas tube.	Clean.
Won't Lock	Dirt, corrosion, or carbon buildup in barrel locking lugs.	Clean lugs.

Bullet stuck in bore

- **DANGER:** If an audible "POP" or reduced recoil is experienced during firing, IMMEDIATELY CEASE FIRE!

  1. Remove the magazine.
  2. Lock the bolt to the rear.
  3. Put selector lever on the **"SAFE"** position.
  4. Check for a bullet in the bore with a cleaning rod.

- **Do not apply the immediate actions described in the previous section. If a bullet is stuck in the barrel of the weapon, do not try to remove it. Take the rifle to a qualified gunsmith.**

Congratulations on achieving the rank of amateur gunsmith.

I greatly appreciate your interest in my first published book and look forward to any feedback that may help in my writing career.

If you're also interested in handmade tactical gear I tend to make, consider looking at my ebay page in case there's anything for sale, like this:

https://www.ebay.com/usr/chaoscustoms

Free Men Do Not Ask For Permission To Bear Arms